



Iowa Board of Dental Examiners.

The Iowa State Board of Dental Examiners will hold its next examination at Iowa City, December 1, beginning at 9.00 A. M.

Practical examination in operative and prosthetic dentistry. All fees must be in the hands of the secretary by November 15.

E. D. BROWER, Secretary.

Le Mars, Iowa.

Wisconsin State Dental Society.

The Wisconsin State Dental Society held its annual meeting July 21, 22, 23, 1908, at La Crosse, Wis. The convention was one of the most profitable and enjoyable in its history. The society was reorganized and the following officers elected:

President, W. H. Mueller, Madison, Wis.; first vice-president, G. F. Hauser, La Crosse, Wis.; second vice-president, E. A. Geilfuss, Goldsmith Building, Milwaukee, Wis.; secretary, Harvey N. Jackson, Wells Building, Milwaukee, Wis.; treasurer, Adolph Gropper, Goldsmith Building, Milwaukee, Wis.; librarian, H. G. Morton, Mack Block, Milwaukee, Wis.

Executive Council: W. H. Mueller, Madison, Wis.; Harvey N. Jackson, Milwaukee, Wis.; Adolph Gropper, Milwaukee, Wis.; A. J. Du Bois, Neenah, Wis.; Geo. C. Marlow, Lancaster, Wis.; E. C. Oviatt, Columbus, Wis.; E. C. Smith, Eau Claire, Wis.; W. C. Wendel, Milwaukee, Wis.; T. A. Hardgrove, Fond du Lac, Wis.; Charles Southwell, Milwaukee, Wis.; E. A. Gatterdam, La Crosse, Wis.; W. A. Gamble, Fox Lake, Wis.

Programme: Chas. L. Babcock, Colby & Abbott Building, Milwaukee, Wis.

Clinic: Chas. Southwell, Goldsmith Building, Milwaukee, Wis.

Local Arrangements: E. A. Geilfuss, Milwaukee; A. A. Jennings, Milwaukee; Geo. P. Brenner, Milwaukee.

Science and Literature: Arthur Holbrook, Milwaukee.

Art and Invention: F. S. Robinson, Chippewa Falls, Wis.

Publication: R. R. Powell, Janesville, Wis.; M. L. Christensen, Oshkosh, Wis.; Harvey N. Jackson, Milwaukee, Wis.

Board of Censors: F. G. Van Stratum, Hurley, Wis.; Franklin R. Houston, Green Bay, Wis.; B. C. Campbell, Lake Geneva, Wis.

Infraction of Code of Ethics: J. L. Malone, Superior, Wis.; E. J. Hart, Madison, Wis.; C. T. Rodolf, Muscoda.



A Study of the Maxillae with Regard to Their Blood and Lymph Supply. IV.

BY JOHN BETHUNE STEIN, M.D.

*Professor of Physiology and Histology, New York College of Dentistry.
Professor of Physiology, Veterinary Department, New York University.*

Dentin. Each dentinal tubule is said to possess a sheath (dentinal sheath of E. Neumann¹) which is looked upon by most writers as a more resistant and harder dentin immediately surrounding the tubule.

Neumann considers the sheath to be a calcified structure. Others state that the sheath can be isolated like that of the bone canaliculi. It is said that the walls of the canaliculi of bone possess a greater degree of resistance to the action of strong acids than does the rest of the bone. According to Kölliker² (see Fig. III), "Each canal (dentinal tubule) has a special wall, rather less in thickness than its diameter, which can only be observed in transverse sections (and then not always), as a narrow, yellowish ring surrounding the cavity; in longitudinal sections, on the other hand, it is almost entirely invisible. During life the

¹ E. Neumann, Beiträge zur Kenntniss des normalen Zahn und Knochengewebes. Leipzig, 1862.

² Kölliker, Manual of Human Histology, Vol. II, 1852



FIG. 106.

canals contain a clear fluid, and they can not therefore readily be detected in recent preparations; it is different in dry sections, when they become filled with air and appear separately as black lines by transmitted light, and by reflected as silver threads."

Fig. 106 was taken by reflected light. The dark structure having the appearance of a fiber within a tube separated from its wall by a light area is an artefact. The appearance of the shining branching fiber within the tube is owing to the fact that the tube contained air and also to the focusing and the illumination of the specimen. If we hold the picture at a distance when we look at it, the true condition is appreciated.

Kölliker further states that, "The apparent walls of the dentinal tubuli, which are commonly visible in transverse sections, are not the

actual walls of the canals, but rings, which result from our invariably viewing a certain length of the canals in the always more or less thick sections, their undulating course giving the walls a greater apparent thickness than they really possess. If in any transverse section the apertures of the canals be exactly brought into focus, we perceive,

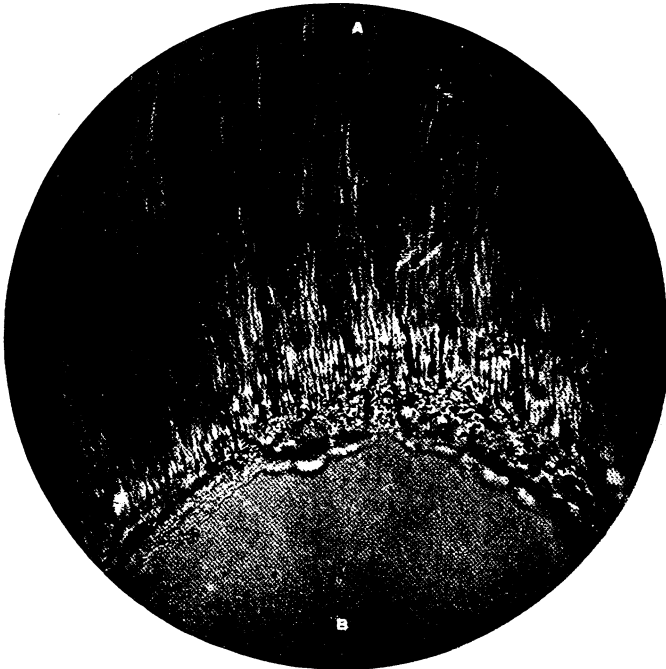


FIG. 107.

instead of the dark ring, only a very narrow yellowish border, which is what I consider to be the actual wall. That such is the case, appears from the examination of transverse and oblique sections of canals filled with fluid, in which short, yellow tubules and small rings, of almost the same diameter as that of the cavities of the canals, may be clearly recognized."

W. Waldeyer³ states that: "The dentinal fibers constitute the soft part of dentin. They do not lie in direct contact with the hard matrix.

³ W. Waldeyer, Structure and Development of Teeth, in Striker's Human and Comparative Histology, Vol. I, 1870.

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but are invested by sheaths, the dentinal sheaths of E. Neumann, which are intimately connected with the matrix. After the fibers have been removed by maceration or by incineration of the tooth, the dentinal sheaths remain, and even after destruction of the matrix by boiling in strong hydrochloric acid or in caustic alkalies, they constitute the only perfectly indestructible residue of the tooth. They form the white



FIG. 108.

finely fibrous felt which still remains after treatment with the above mentioned reagents."

We find Waldeyer also stating that, "In sections made from fresh teeth, examined with high powers (500-1000), it is not difficult to recognize, especially in the central section of the course of the tubules, which is of considerably larger diameter, the pale homogeneous dentinal fiber. The lining of the tubules (dentinal sheaths) can only be satisfactorily seen in the cross section, when they appear as delicate yellowish rings, in the interior of which the transverse section of the dentinal fiber is perceptible in the form of a minute dark spot. I, at least, agree with Kölliker in this interpretation of the appearances seen on cross section. Carious teeth prove very serviceable in exhibiting these relations."

Fig. 107 shows a part of a tooth in transverse section, with a view of a slanting portion of the wall of the pulp cavity exhibiting the dentinal tubules in more or less transverse section (those containing air are black, and stand out conspicuously). At the place where the slanting wall of the pulp cavity begins we can look into the tubules and see



FIG. 109.

them open on this wall. The upper part of the specimen shows numerous tubules in oblique section. A is the dentin and B the pulp cavity.

Fig. 108 presents a section of the pulp cavity (1). A part of the wall of this cavity (2) is in a plane at a right angle to the optical axis. The openings of the tubules are therefore more or less in the plane of the optical axis. Toward the left (3) we see a number of tubules opening into the pulp cavity; they appear for the most part like regular grooves, as they have been cut in a plane parallel with their longitudinal axes. At the upper part (4) the tubules are extremely irregular.

The next picture, Fig. 109, is an extremely oblique section of a tooth

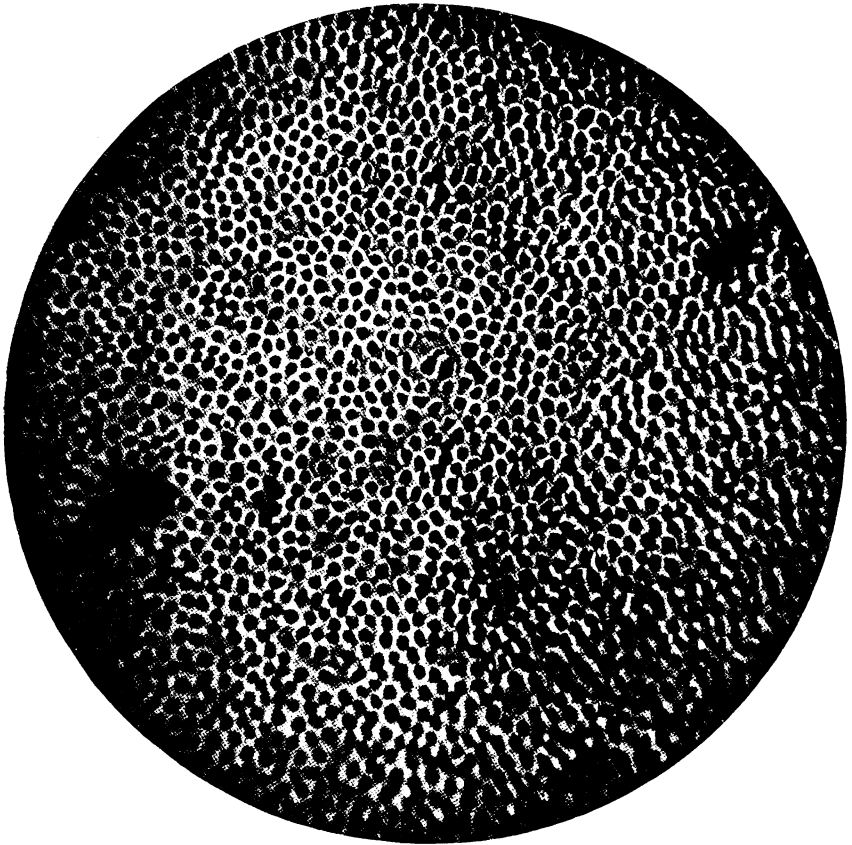


FIG. 110.

at the junction of the enamel (above) and dentin (below). Oblique sections of the terminations of the dentinal tubules are seen. In some instances, however, the sections of the dentinal canaliculi are transverse. A few enamel prisms with their inter-prismatic substance are shown in transverse section. This picture and Figs. 106, 110 and 112 were taken with a Leitz No. 7 objective and a No. 3 ocular. Figs. 107 and 108 were taken with a No. 5 objective.

In Fig. 110 we have another specimen of dentin from a human tooth; we are looking at the wall of the pulp cavity, and into the dentinal tubules. The majority of the tubules are the same in diameter and the thickness of their walls is also the same. Here and there we find

tubules with walls of relatively great thickness, which have sometimes but not always a greater diameter. In some places a number of tubules open into one another, forming spaces with serrated walls; as to whether these are artefacts I do not know. The openings of the tubules are usually more scattered than in this specimen; here the tubules appear closely crowded together. This place in the specimen was selected as the best representation of what we have seen in a great many specimens of teeth which have been kept for a long time, and which were thoroughly

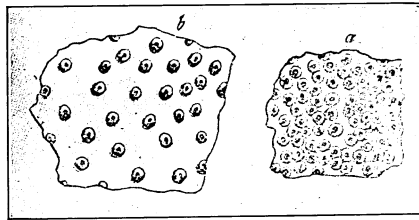


FIG. 111.

Transverse section of dentinal canals as they are commonly seen, $\times 450$: *a*, canals very close together; *b*, more dispersed (after Kölliker).

dried. This picture certainly does not conform to the description of these tubules as given by Kölliker and others, and we do not see any evidence of Neumann's sheath. If we examine Kölliker's picture (Fig. 111) of a transverse section of the tubules (which has made its way into many of the works on histology for over half a century), our findings will not agree. Kölliker's picture was evidently taken from a specimen of fresh dentin. Kölliker, however, neglects to state whether his specimen was fresh, old and dried, or a decalcified one. We, however, in Fig. 110 are not looking at the sectioned surface of dentin, neither do we find sections of dried dentin with the dentinal tubules in transverse section giving the appearance described by most writers. (See Fig. 112.)

Fig. 112 gives us a transverse section of dried dentin. Some of the tubules contain air; as to what the others contain we can not state with any degree of precision. They probably contain dried organic matter and some of the medium (balsam) in which the specimen was mounted. One thing is certain, that in most specimens of teeth, it is impossible to get rid of all the organic matter. Intra-alveolar periosteum

often clings to the teeth, and when dried has a dirty brown hue. We often find the pulp appearing as a dirty yellowish brown very adherent to the dentin, and even within the tubules we see material which makes us think of the materials we have sometimes seen clinging to the outside of the tooth and in the pulp. Fig. 89 (upper left hand of specimen) shows us some of this dried organic material and the intra-alveolar peri-

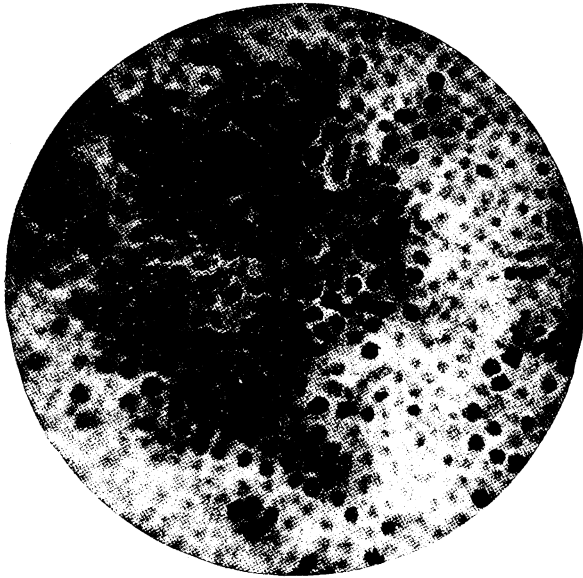


FIG. 112.

osteum seen at 4 in Fig. 89, and again in Fig. 123 has the same appearance. The writer is well aware of the difficulties experienced in studying such a structure as dentin, especially regarding the presence of the sheath of Neumann in dried specimens. A facile touch to the micrometer screw will bring our desired image into view; for remember we are dealing with an air bubble in a tube; we are not viewing all our tubules in transverse sections; the section is more or less thick and the dentinal tubules are undulating, and it is perfectly possible to produce as an artefact the sheath of Neumann. This we could do with specimens such as those seen in Figs. 110 and 112. If we review the statements of Waldeyer and Kölliker regarding this sheath of Neumann, and compare the pictures 110 and 112 with those of a fresh, fixed, decalcified and stained specimen,



FIG. 113.

which we shall later examine, our way will be clearer toward the interpretation of this sheath of Neumann. The lining of the tubules, as stated by Waldeyer and Kölliker, "can only be satisfactorily seen in cross section, and then not always." If the sheath of Neumann is a differentiated part of the dentin, is a more resistant and harder dentin, and is a calcified structure, as Neumann says it is, why do we not see it in specimens 110 and 112, and in all dried specimens, such as are seen in Figs. 106, 107, 108 and 109? We can not find the structure described by Neumann, Kölliker and Waldeyer in dried dentin, but in a fresh specimen we can find it, and in dried ones we can obtain, by focusing and adjusting the light, an artefact which stimulates the sheath of Neumann.

We therefore think the interpretation of our specimens, as given in Figs. 110 and 112, is the true one, and that the focus was correct, especially for the center of the specimen. For the above reason and others, which we shall later explain, we do not regard the sheath of Neumann as a

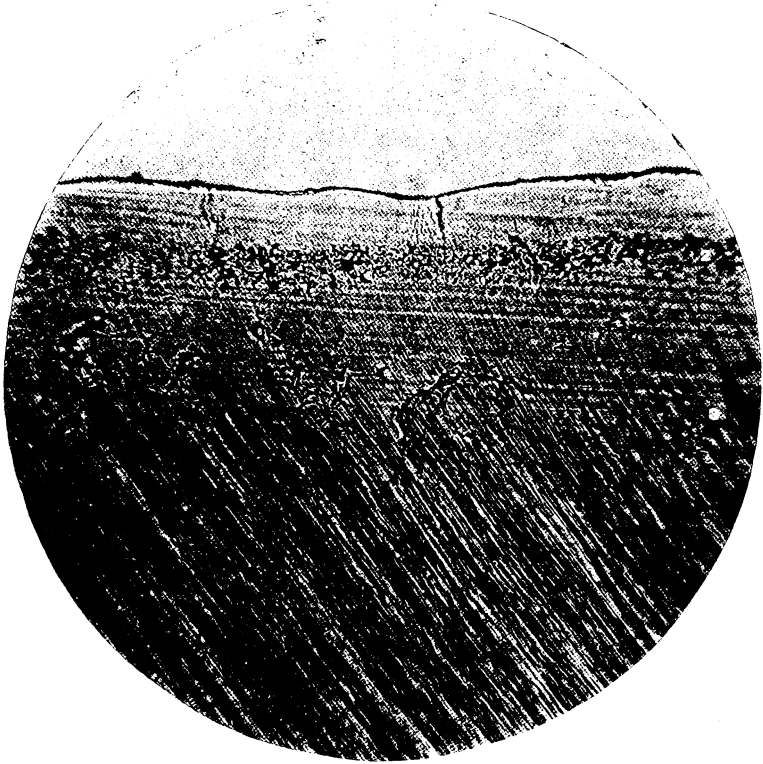


FIG. 114.

more resistant or harder dentin, and do not think it is calcified; therefore we shall not study it until we come to the discussion of the soft structures of the tooth.

We must remember that the wall of the pulp cavity does not easily lend itself to the work of the photo-micrographer. It is difficult to obtain any great number of tubules having their long axes in the optical axis, for the contour of the wall is extremely irregular; a hill here, a hollow there, here many, there only a few tubules. The above applies

especially to the study of fresh specimens of dentin, with a view to demonstrating Neumann's sheath and the dentinal fiber.

Peculiar large and small irregularly shaped spaces, bounded by globular process of dentin (interglobular spaces of Czermak¹) are



FIG. 115.

said to be never entirely absent in teeth. According to Kölliker, they often form a thin curved layer extending along the whole inner surface of the enamel. They intersect and interrupt the dentinal tubules. Sometimes the spaces are very wide (Fig. 113) interrupting and intersecting many tubules, sometimes very small (Figs. 100, 102, 103, 104), so that few tubules reach them. The large spaces are limited by distinct globular projections of dentin (dentinal globules of Kölliker) which are pierced by the dentinal tubules (see Figs. 104 and 113).

¹ Czermak, Beiträge zur mikrosk. Anatomie d. menschl. Zähne. Zeitschrift f. wiss. Zool., 1850, bd. II.



FIG. 116.

The dentinal globules are not always distinct in the smaller spaces, and this is especially true of the smallest spaces, which have a notched form, and also communicate with dentinal tubules (see Figs. 100, 102, and 103). In the crown of the tooth the identity of the smaller spaces with the larger can almost always be recognized.

Small interglobular spaces and dentinal globules form a zone between the dentin and cement (Fig. 114, at 2), which has a more or less granular appearance, hence the term Purkynje's, or Tomes' granular layer.

Fig. 113 shows the interglobular spaces lying beneath the enamel (upper part of picture), with the dentinal globules of Kölliker clearly

seen. In this specimen the interglobular spaces contained no air. They were, however, true spaces, the walls of which could be determined by proper focusing.

In Fig. 104 the dentinal globule is not in focus; it constitutes the circle within the crown shaped form taken by the interglobular spaces.



FIG. 117.

The intersecting and interrupting of the dentinal tubules is especially well seen in Figs. 100, 102, 103, and 104.

In Fig. 114 is an extremely thin section of cementum (1) and dentin (3) near the dento-cementum junction. Note how closely the spaces in the granular layer (2) resemble the interglobular spaces of Czermak.

Spaces are found in the dentin beneath the floor of the pulp cavity, at the place where the roots of the teeth (Fig. 115) meet, and especially on the walls of the pulp cavity into which the dentinal tubules pass.

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The specimen in Fig. 115 was taken from the dentin between two root canals; note how the tubules from either side meet in spaces, how the tubules form terminal loops, and the well marked anastomosis of the side branches of the tubules.



FIG. 118.

After long maceration in hydrochloric acid, the substance which apparently constitutes these spaces offers, like the bone and dentinal canaliculi, a greater resistance, and hence like the two latter may be completely isolated. In sectioned teeth this so-called interglobular substance dries up, and a cavity is produced, into which the air passes. Szymonovicz,⁵ in his text book of histology, shows a drawing of the dentinal canaliculi and Czermak's interglobular spaces filled with pigment. Kölliker states that, "it is only in reference to these" (sections in which

⁵ Szymonovicz. (MacCallum.) A text book of Histology and Microscopic Anatomy, 1902.

the interglobular substance has dried up) "that the interglobular spaces can be spoken of. Many teeth, indeed, exhibit no interglobular substance, but they occasionally present the outlines of dentinal globules, in the form of delicate arched lines." Kölliker makes the arbitrary

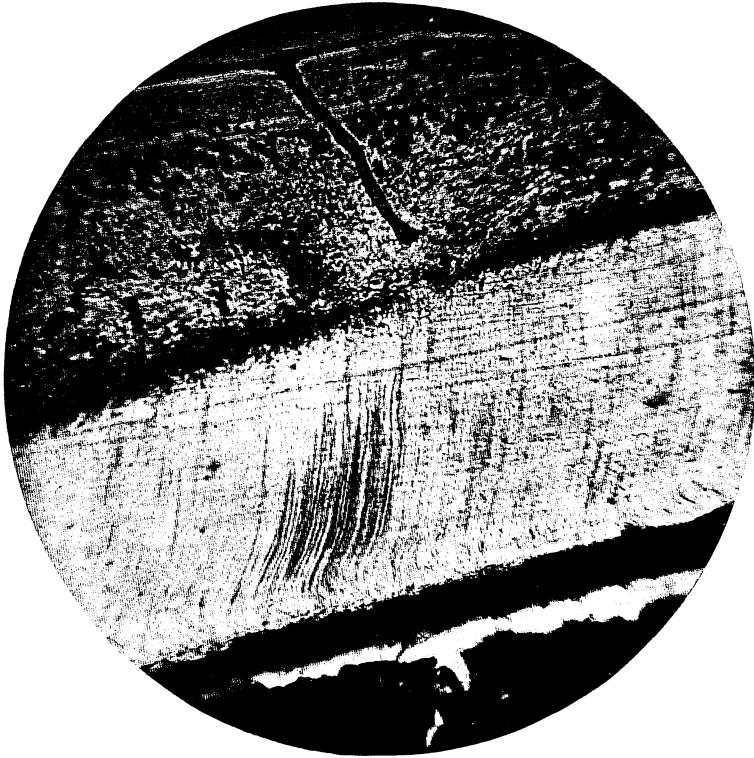


FIG. 119.

statement, "The interglobular spaces whose presence is normal in developing teeth, contain during life, not fluid, as might at first sight be expected, but a soft substance resembling tooth cartilage, and possessing a canaliculated structure like dentin itself." Most authors look upon the interglobular substance as uncalcified dentin.

Cementum.

The cementum (*substantia ostoidea*) acts as the bony cortex of the tooth. It is the softest of the dental tissue. The internal surface of the cementum is intimately connected with the underlying dentin (Fig. 116). It

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is stated that there is no sharp line of demarcation between the two, and apparently no connecting substance. Compare Fig. 114 with 117.

The cementum covers the roots of the teeth, and in molars and premolars not uncommonly unites them together (see Fig. 65). It com-



FIG. 120.

mences as a thin layer where the enamel ceases, either overlapping the enamel or abutting upon it; as it passes toward the apex it increases somewhat in thickness, and attains its greatest maximum at the lowest part of the root and on the alveolar surface of the tooth between the roots of the molar teeth (see Figs. 124 and 126). The external surface of the cementum is closely surrounded by the intra-alveolar periosteum, and the latter is firmly united by means of Sharpey's fibers.

The matrix may be granular, amorphous (Fig. 117, upper part of picture), transversely striated (Figs. 116 and 118), or lamellated (most frequently) lengthwise (Figs. 116, 118, 120, 123 and 124).

Lacunae and canaliculi are found in the cementum. Rarely do we meet with canals resembling Haversian canals (Figs. 119 and 120). They do not occur in young teeth where the cement has only its normal thickness. They are very common in old teeth, especially molars.



FIG. 121.

Both Leeuwenhoek⁶ and John Hunter⁷ had recognized the cement as a distinct structure. The discovery of this tissue has been therefore wrongly attributed to Blake⁸ and Tenon.⁹

Sometimes tubules are found, resembling dentinal tubules (Figs. 118 and 121), and very rarely do we come upon other more abnormal cavities.

The lacunae vary in size, number and form. They may be round

⁶ Leeuwenhoek, l. c.

⁷ John Hunter, *The Natural History of the Teeth*, London, 1778.

⁸ Blake, *De dentium formatione et structura*, Edinburgh, 1798.

⁹ Tenon, *Mem. de l'institut national*, An. VI.

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(Figs. 116 and 117), pyriform (Fig. 122) or oval, and then they lie parallel to the long axis of the tooth. Some have an elongated form, with a narrow canal-like cavity which closely resembles the dentinal tubules (Fig. 121). The lacunae in old teeth are numerous, irregular in shape, having



FIG. 122.

mostly an elongated form. The lacunae are usually absent in the upper third of the tooth, toward the crown. We first meet them scattered and solitary in the middle third, and they gradually increase in numbers toward the lower extremity of the tooth, where they tend to arrange themselves in a more or less regular manner, somewhat as you have seen them in bone, lying in series in the cement, and sending most of their canaliculi inward and outward, giving rise to the transverse striation above spoken of, which is more or less fine and even.

The canaliculi are longer and more numerous than in bone (see Figs. 116, 118 and 121). They sometimes resemble feathers and brushes (Figs. 122 and 123). They connect the lacunae with one another, unless they are isolated. They anastomose with the dentinal tubules.

Canals are very often seen resembling dentinal tubules, which may be either closely set (Fig. 118) or isolated (Fig. 121). Sometimes they branch and seem to connect the canaliculi of the lacunae with the dentinal tubules, or Tomes' granular layer (Fig. 121).



FIG. 123.

In Fig. 116, passing from below in the dentin upward into the cementum, we can see Tomes' granular layer, and from it canaliculi penetrating the cementum. Round and oval lacunae, with their canaliculi, are found in the cementum. Above the lacunae we note other canaliculi passing toward the external surface of this tissue. The lamellated structure of the cementum is especially well shown, and here and there, in layers, the granular appearance which sometimes obtains in cementum is seen. The specimen was taken from the middle third of the root of a molar tooth (buccal surface).

An extremely thin and oblique section of dentin and cementum is shown in Fig. 117. A part of the granular layer of Tomes is seen at the left half of the specimen. Note the tips of the dentinal tubules and the line of demarcation between the cement and dentin, which some

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what resembles the appearance seen at the dento-enamel junction. To say there is no sharp line of demarcation between the cementum and dentin is not strictly correct, for in thin sections, as you see here, there is one. This specimen was taken from the lower third of the



FIG. 124.

outer side of root of the tooth. More or less oval and round lacunae with their canaliculi are obvious.

The longitudinal and transverse striation is seen in Fig. 118. The lamellae here shown are the same as we have seen in bone, alternate dark and light layers. Compare this with Fig. 10. The canaliculi resembling dentinal tubules and giving rise to the appearance of a transverse striation is extremely well marked. Compare the dentinal tubules in the lower half of the specimen with the canaliculi in the cementum in the upper half; Tomes' granular layer is seen distinctly separating the

two. This specimen was taken from the upper part of the middle third of the inner side of the root of the tooth.

An Haversian canal penetrates the cementum in specimen Fig 119, which was obtained from the middle third, inner surface, of the root of

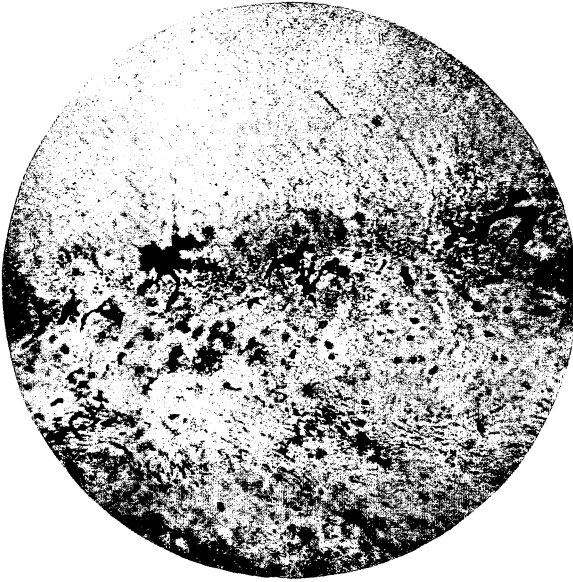


FIG. 125.

a molar tooth. The age of the subject from whom this tooth was obtained is not known; it was taken from a cadaver, and appeared normal (see Fig. 127). A short distance below the blind end of this canal is seen Tomes' granular layer; then the dentin, with a few obvious tubules, and farther below the root canal, with some dried organic matter of the pulp attached to the dentin, and some more still further below, torn off from the attached portion. The lamellated appearance of the cementum and the regular arrangement of the lacunae in layers are very distinct.

Fig. 120 is another Haversian canal (photographed with a lens of higher power than Fig. 119) in a section of cementum taken from the lower external surface of the tooth. The upper part of the picture is the free surface of the cementum. Almost the whole canal is in longitudinal section. There is no Haversian system of lamellae. The lamellae are arranged in the long axis of the tooth, and the lacunae are well shown.



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Fig. 121 is a section of dentin and cementum taken from the lower third and outer surface of the root of a tooth. The canals in the cementum simulating dentinal tubules are quite large; some are seen in longitudinal, a few in oblique and transverse section. Most of the openings which appear as tubules in transverse section are lacunae which contain no air, and consequently do not have the appearance of a lacuna with its canaliculi; many of these, however, on careful examination were found to be the canals above mentioned, in transverse section. The homogeneous condition of the cementum is particularly well seen here.

Fig. 122 gives us several irregularly formed lacunae, one of which has an elongated canal which opens on the free surface of the cementum, the other end of the lacunae has numerous branching canaliculi anastomosing not only with the canaliculi of the same lacuna, but with those of adjacent ones.

An especially beautiful section of cementum (above) and dentin (below) is exhibited in the specimen in Fig. 123. The lamellated structure is evident. Compare the picture with Fig. 10. Several irregular shaped lacunae are also seen.

We present in Fig. 124 a specimen of cementum taken from this tissue at the point where the roots of a molar tooth meet. The crescentic shaped part at the top is dentin. The granular layer of Tomes is next seen, and passing into the cementum from the dentin and Tomes' layer are numerous tubules resembling dentinal tubules. At the lower part of the specimen many lacunae are seen, and at the free surface some shreds of the intra-alveolar periosteum are clinging to the tooth. Two large cracks are found in the specimen. The lamellae are well marked, and the thickness of the layer of this tissue in this locality is important for us to notice.

Fig. 125 is a very thin section of cementum (below) and dentin (above), showing at the zone in the center of the specimen a number of inter-globular spaces. The specimen was taken from the dento-cementum junction at the point where the roots of a molar tooth meet.

The foregoing specimens were prepared and photographed with the assistance of Mr. John L. Peters, at the Laboratory for Physiology and Histology of the New York City College of Dentistry.

(To be continued.)



History of the New Jersey State Dental Society.*

BY ALPHONSO IRWIN, D.D.S.

Read before the New Jersey State Dental Society, 1908.

**Twenty-sixth
Annual Convention,
1896.**

The Twenty-sixth Annual Convention was held in Asbury Park, Vice-president Harvey Iredell presiding in the absence of R. M. Sanger, who had unexpectedly gone to Europe.

The secretary read President Sanger's annual address, which recommended the establishment of a prosecuting fund to be used to defray the expenses incurred in prosecuting illegal practitioners of dentistry.

Cataphoresis.

The papers read were devoted to a consideration of "Oral Hygiene," by Dr. L. Ashley Faught; "Painless Dentistry," by Dr. S. Freeman; "Filling of Canals and Pulp Cavities," by Dr. Edward Halsey; and "Systematic Medication," by W. G. Chase.

The clinics comprised fourteen subjects, but cataphoresis monopolized attention this year.

Five applicants were elected to membership.

The secretary announced that, by the advice of the Executive Committee, he had just closed a contract with the *ITEMS OF INTEREST* to publish the proceedings of the Society, and the first installment would appear in September and the completed minutes would be ready for the members January 1, 1897. He also stated that hereafter the *ITEMS OF INTEREST* would be the official organ of the Society.

* Continued from January Issue, page 59.—Ed.

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The establishment of a prosecution fund and the appointment of a committee of three to prosecute illegal practitioners were adopted on motion as recommended in the president's address.

Dr. G. Carleton Brown was recommended to the Governor for appointment on the Board of Examiners. The twenty-sixth convention was the Cataphoresis Convention.



DR. R. M. SANGER
President, 1896

**The Twenty-seventh
Annual Convention,
1897.**

President Harvey Iredell called the twenty-seventh annual meeting to order at the usual time in Atlantic City at the Grand Atlantic Hotel.

The president reviewed the events of the last year's meeting, recommended the appointment of an assistant secretary, the revision of the code of ethics, and scored dental patents upon methods of relieving human suffering.

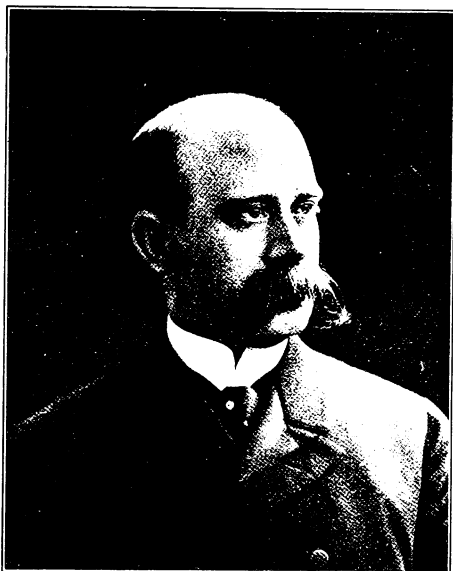
Twenty-one papers were read by essayists and discussed by sixteen dentists of national repute. We held one of our most successful and memorable meetings in 1897.

Fourteen dentists were elected to membership.

Drs. J. A. Osmun, A. R. Eaton, and R. M. Sanger were appointed a committee to revise the code of ethics.

Drs. G. Carleton Brown, F. C. Barlow, and C. S. Stockton were appointed a committee to procure from Congress a statute in relation to dental patents. A committee on Dental Prophylaxis was appointed, consisting of Drs. S. C. G. Watkins, O. J. Wilson, B. F. Luckey, C. W. F. Hoblitzell and J. A. Waas.

Eleven clinics were held by experts upon the subjects selected.



DR. HARVEY IREDELL
President, 1897

Pirates.

Whenever this convention is alluded to, some of the members begin to feel around in alarm for their pocketbooks. We fell into the hands of Atlantic City pirates, or their descendants, who had become Bonifaces, at this annual meeting.

**Twenty-eighth
Annual Convention,
1898.**

President J. L. Crater presided over the twenty-eighth annual meeting in Asbury Park, and Rev. A. J. Miller offered prayer.

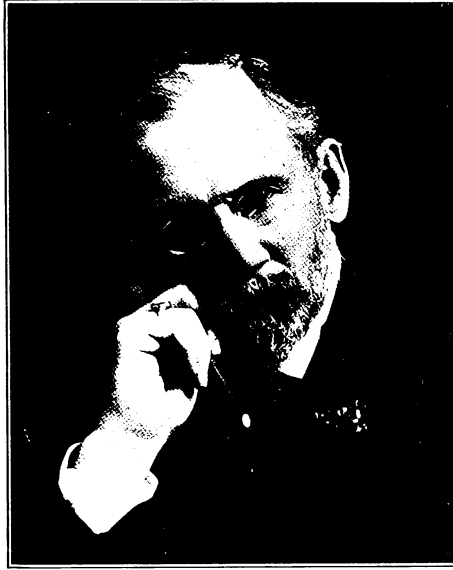
Dr. Crater read the annual address, which announced the passage of the new dental law for New Jersey, also the meeting of the National Dental Society in Omaha. The Society was urged to increase its membership.

Nine papers were read on the most engrossing topics of the day, and the discussions were conducted by nineteen dentists.

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Mr. Craig, the official stenographer of the Society for twenty-one years, wrote that owing to failing health, he was compelled to relinquish the reporting of the Society's meetings. In accepting this resignation, an appropriate resolution of regret was passed and forwarded to Mr. Craig.

Eight applicants were elected to membership.



DR. J. ALLEN OSMUN
President, 1899

**The Dentacura Company
—An Injunction.**

A special meeting of the Society was held in Newark, September 24, 1898, when the services of Mr. Halsey M. Barrett were retained as legal counsel and an injunction placed upon the Dentacura Company, restraining them from "Publishing extracts from a report made by a committee of the complainant (the N. J. State Dental Society), upon the grounds that the aforesaid report was property of the Society." The court granted this injunction.

**Twenty-ninth
Annual Convention,
1899.**

The meeting was called to order by President Dr. J. A. Osmun in Asbury Park, in July, 1899. Rev. J. G. Reed offered prayer.

The president's address called attention to the changes in the hours of the sessions, and the omission of the afternoon meeting. He commended highly the work of the

Essay, Clinic and Exhibit Committees, and advised the appointment of an editor to arrange papers to be brought before the Society. He thought that the dentistry of the future would be divided into specialties.

A memorial paying honorable tribute to Dr.

Jeremiah Hayhurst. Jeremiah Hayhurst, prepared by Dr. C. S. Stockton, was read, adopted and entered upon the minutes.

Eulogistic remarks concerning the dead member were made by Drs. Chas. A. Meeker, F. E. Riley and G. E. Adams.

The papers this year were entitled, "Oral Pathology," by I. N. Broomell; "The Value of High Fusing Porcelain in Contour Work," by Dr. Jos. Head; "The Porcelain Era," by Dr. W. A. Capon; "Habitual Malocclusion," by Dr. Wm. E. Truex; "Aseptic Environments," by M. L. Rhein, M.D.; "Experience with Split and Perforated Roots," by Dr. N. M. Chitterling, M.D., and "The Cause and Prevention of Dental Decay," by Geo. H. Winkler, M.D.

The seven papers were discussed by Drs. John I. Hart, R. Ottolengui, Jos. Head, C. A. Meeker, W. W. Walker, R. M. Sanger, E. A. Bogue, R. H. Jones, H. C. LeRoy, N. S. Jenkins, W. A. Capon and Dr. Horn, of China.

A Verdict Against the Dentacura Company. It was announced that the New Jersey State Dental Society won their suit against the Dentacura Company, both in the Court of Chancery and the Court of Errors and Appeals. It cost \$350.00 to defray the legal expenses.

The report of the Committee on Oral Prophylaxis for 1898 was omitted from the minutes and the committee advising this procedure also admonished the members that all reports should be carefully prepared and submitted to appropriate committees before the annual convention.

The Army and Navy Dentist. The motion prevailed that "this Society" recommend that the Government should appoint dentists in the Army and Navy, and a committee should be appointed to co-operate with other dental societies in promoting the matter.

The annual reports from committees on Materia Medica, Clinics, Dental Literature, Executive and Membership were received. Several resolutions of importance were passed, amongst which might be mentioned one, that speakers should be limited to fifteen minutes and persons who have been expelled or refused membership should not be admitted into the meetings.

Nine clinics were presented, including such operators as Dr. N. S. Jenkins, of Dresden, Germany, Drs. Jos. Head, Wm. A. Capon

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and R. Ottolengui, devoted to porcelain work. The five other clinics were devoted to miscellaneous subjects.

This was the Porcelain Convention.

**The Thirtieth
Annual Convention,
1900.**

The thirtieth annual meeting in the Auditorium at Asbury Park, was presided over by Dr. W. E. Truex with the judicial equipoise for which Dr. Truex is noted.



DR. W. E. TRUEX
President, 1900

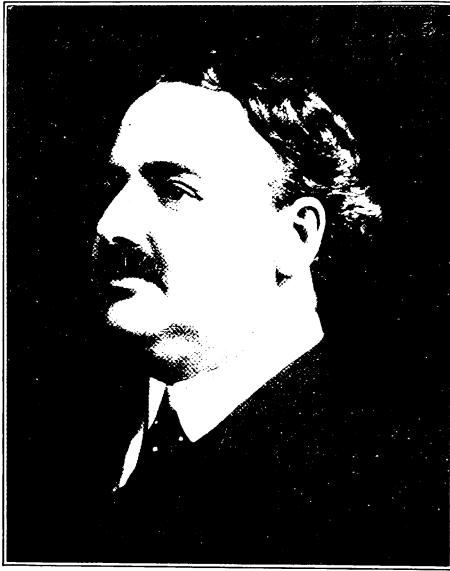
After the annual address was read by the president, papers were presented, entitled, "Non-Cohesive Gold," by H. B. Tileston; "Combination of Oxyphosphate with Gold and Amalgam," by Dr. F. L. Fossum; "Dental Jurisprudence in its Relation to State Examining Boards, the Profession and the Laity," by Dr. J. A. Osmun; "A Quarter of a Century of Official Life in the New Jersey State Dental Society," by Dr. C. A. Meeker; "The Eyes and the Teeth: Some Concomitant Pathological Changes," by E. Underhill, M.D.; Dr. Meeker's paper contains many noteworthy historical references. A lecture was delivered by Dr. Thos. C. Stellwagen, Jr., of Philadelphia, upon "The Blood."

The discussions were entered into by Drs. C. S. Stockton, J. D.

Patterson, Wm. Trueman, W. V-B. Ames, R. M. Sanger, J. N. Crouse, H. B. Tileston, J. A. Osmun, Goldsmith, H. C. Register, H. Iredell, F. L. Fossume, G. Carleton Brown, R. M. Dawbarn, and J. E. Riley.

A choice array of clinics were presented by Drs. W. V-B. Ames, F. L. Fossume, W. A. Capon, Geo. Evans, W. L. Mason, R. H. Jones, Wm. H. Mitchell and Jochichi Takamina.

Nine applicants were elected to membership.



DR. F. EDSALL RILEY
President, 1901

**The Southern Dental
Society of N. J.**

The announcement of the formation of the Southern Dental Society of the State of New Jersey was made by Dr. A. Irwin, and a copy of the constitution and by-laws were presented.

**The Dental Protective
Association.**

Dr. J. N. Crouse outlined the status of affairs in regard to the Dental Protective Association, the Tooth Crown Company patents, and the N. H. dentists' position. The Society expressed confidence in the work of Dr. Crouse and the Dental Protective Association, which was ultimately incorporated in the form of a resolution.

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MISS MARY WILLIAMSON HULL

The N. J. D. E.

A resolution was also passed requesting the New Jersey State Board of Examiners to withdraw their resignation from the National Board and continue their membership in that body.

The reports of the Committees on Literature, Materia Medica, Clinics, Exhibits (over forty exhibits were made), were received.

**The Third International
Dental Congress,
Paris, 1900.**

Dr. Chas. A. Meeker, Alphonso Irwin and C. W. F. Holbrook were elected delegates and represented the New Jersey State Dental Society at the Third International Dental Congress in Paris, France, in August, 1900.

**The Thirty-first
Annual Convention,
1901.**

Dr. F. L. Riley, the president, welcomed the Thirty-first Annual Convention. In presenting his address, he said: "Our last convention was the greatest ever held, in regard to attendance, essays, clinics and exhibits; the revised statute secured by our Committee on Legislation gives us a dental law second to none." The Examining Board and the Co-operative Prosecuting Committee, consisting of one member from each county, were extolled. The Society was cautioned to use more care in the selection of officers and reminded that one section of the State should not always monopolize the offices. Dr. F. E. Riley possessed great personal magnetism. He inspired every one who came into contact with him with confidence, and possessing a keen insight into human nature, he presided over a convention remarkable for many things.

The papers read were as follows: "Soldering Made Easy," by H. W. Northrop; "Painless Dentistry," by Dr. W. St. George Elliot; "Porcelain Fillings after Twelve Years," by Dr. W. A. Capon; "A Study of Acids Occurring in the Mouth," by Prof. H. H. Boom, M.D.; "A System of Retaining Springs for Partial Plates and Removable Bridges," by Dr. W. E. Griswold.

After a lengthy discussion of these papers by thirty speakers, nineteen applicants were proposed and sixteen elected to membership.

Dr. E. O. Peck was elected a corresponding member.

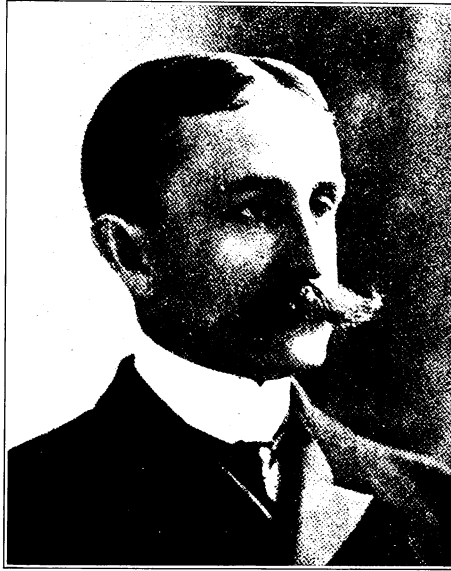
Miss M. W. Hull.

Miss M. W. Hull, a typical American girl, who had faithfully attended the meetings of the Society for many years with her father, Dr. H. H. Hull, our honored treasurer, was unanimously elected an honorary member of the Society. Whenever the time approached for the annual convention to be held no obstacle was ever great enough to keep her

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away, and we would almost as soon expect the day to appear without the sun as Dr. H. H. Hull without "our Maysie."

She was often wittily alluded to as the "Mascot" of the New Jersey State Dental Society, and all who knew her admired her happy and winsome character, while they respected her for her practical nature and sensible deportment. These few lines are written as a tribute of



DR. W. L. FISH
President, 1902

respect to the loveliness that like a sunbeam cast its ray upon our Society for a time, then disappeared only too soon, to shine forever in a blaze of glory in a better world, upon a convention that knows no end. Miss M. W. Hull passed away in 1905.

The State Board. The State Board of Examiners made an annual report, stating that nine out of twelve applicants for a license had passed. The difficulties in making prosecutions against illegal practitioners were explained, the Board unanimously withdrew their resignation from the National Board, and announced that at present we stand alone in demanding a higher standard of professional ability and preliminary education in that National body.

Reports of Committees.

The reports of the Executive, Membership, Clinics, Materia Medica, Dental Literature, Registration and Exhibit Committees were received, and disclosed phenomenal growth in various departments of the Society.

Twenty-three clinics were held and forty-eight exhibits were displayed.

The Thirty-second Annual Convention, 1902.

President Wm. Fish called the Thirty-Second Annual Meeting to order. In his annual address he referred to the wonderful progress made by dentistry, and the good work performed by our watchful examiners. He paid a fitting tribute to the memory of Dr. A. W. Kingsley, a former president, and also to Drs. Benjamin and Hill.

Thirty applicants for membership were elected.

A handsome gavel of novel design was presented by the Borine Company.

The papers read were entitled: "Electric Ozonation in Neuralgia," by Dr. G. Lenox Curtis, which was accompanied by practical demonstrations. Dr. R. Ottolengui read a paper entitled "Should Children's Teeth be Filled with Gold?" Dr. Jochichi Takamina, of Japan, the chemist who discovered the remedy, presented a paper on a new hemostatic (Adrenalin). A paper upon the subject of Ethnographic Odontography by J. A. Thompson was read by Dr. C. S. Stockton, owing to Professor Thompson's inability to be present.

Sixty exhibits were reported by Dr. F. L. Hindle.

The Committee on Arts and Exhibits, also Clinics, Registration, and Executive Committees reported. The Examining Board reported about the interchange of licenses, the result of seventy-two examinations, the registration of dentists, and the enforcement of the laws, through J. A. Osmun, which report was a wonderfully clear and complete compendium of information on the situation of affairs in New Jersey, as related to the law, the public and the dentists.

Among those participating in the discussion might be mentioned Drs. G. L. Curtis, R. Ottolengui, M. L. Rhein, Prof. James Trueman, N. W. Kingsley, John I. Hart and I. N. Broomell.

The reports of the Arts, Inventions, Registration, Exhibits, Clinics and Executive Committees were received as usual and revealed the progress made during the year in these departments.

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The Thirty-third Annual Convention, 1903.

President F. L. Hindle called the Thirty-third Annual Convention to order, and an eloquent prayer was offered by Rev. Willard Conger.

The president took the opportunity in his annual address to call attention to the increased attendance at the meetings of the Society. The superior attractions on



DR. FRANK L. HINDLE
President, 1903

the programme were mentioned, the work of Dr. Osmum on the Board of Examiners was praised for its comprehensiveness and efficiency.

The Interstate Dental Fraternity, National Dental Association and the International Dental Congress were appropriately referred to and three useful recommendations offered in regard to them, which were later adopted. The discussion on this paper was of extraordinary interest and gave renewed impetus to the zest of the participants in the convention, which was one of the most successful ever held. The vigorous, manly, piquant manner of Dr. F. L. Hindle giving unmistakable "tone" to the proceedings.

Seventeen applicants were admitted to membership.

Dr. Otto E. Inglis read a paper entitled "Some Considerations pertaining to Immediate Root Filling."

"The Question of Interstate Reciprocity in Dental License" was presented by Dr. E. C. Kirk in an able and exhaustive document.

Dr. A. W. Harlan discoursed upon "The Drug Aspect of Lesions of the Gum." Dr. D. Genese read a paper on the "Treatment of Fractures of the Jaw." These papers were ably discussed by Drs. J. C. Curry, Jos. Head, R. M. Sanger, R. Ottolengui, C. S. Stockton, A. W. Harlan, E. A. Bryant, B. F. Luckey, E. C. Kirk, L. C. LeRoy, Wilbur Dailey, M. L. Rhein, and A. Irwin.



DR. HERBERT S. SUTPHEN
President, 1904

A brief resume of "New Dental Remedies" by Dr. A. Irwin was read. The report of the secretary of the State Dental Commission was received, which stated that sixty applicants had been examined during the year.

Seventy-two exhibits were reported by Dr. Sutphen, the chairman of the Committee on Exhibits. The Registration Committee reported an attendance of six hundred and seventy-five, through the chairman of the committee, Dr. A. Irwin.

The appointment of Dr. C. S. Stockton on the Board of Examiners was endorsed. Dr. Alphonso Irwin was recommended to the Governor for appointment on the Board of Examiners.

**The Thirty-fourth
Annual Convention,
1904.**

President Sutphen called the meeting to order in 1904. Rev. W. R. Wedderspoon offered prayer. Dr. Sutphen graciously welcomed all present to the Thirty-fourth Annual Meeting of the New Jersey State Dental Society, and referred to the remark-

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ably creditable programme presented for the benefit of the profession. The younger members were invited to participate actively in the discussions and deliberations of the meetings.

A new feature, Exhibitors' Day, was announced, also a reception to guests, members and exhibitors, on Thursday evening.

The formation of the Mercer Dental Society was made known and it was cordially welcomed into the ranks of the ever-increasing number of local dental societies. The adoption of the interchange of license by the N. A. D. E. at Asheville, and the World's Dental Congress at St. Louis each received attention, while the examination of children's teeth in public schools was also urged. Fifteen dentists were elected members.

Papers were read on the "Treatment of Pyorrhea Alveolaris" by Dr. Gordon White; "Six Years' Work in Oral Prophylaxis," by Dr. D. D. Smith; "The Advance of Porcelain Art in Dentistry," by Dr. N. S. Jenkins, Dresden, Germany; "Oral Antisepsis: Its Prophylactic Influence upon Local and General Disease," by Dr. H. C. Register. The discussions were voluminous, spirited, and instructive. Drs. N. S. Jenkins, R. H. Hofheinz, H. C. Register, D. D. Smith, S. Freeman, G. L. Curtis, M. I. Schamberg, Wm. E. Trueman, F. L. Fossume, L. A. Faught and Chas. Butler participating.

A resolution was passed requesting the elevation of the status of the Army dentist to that of a commissioned officer, analogous to the grades of the medical department, and an increase in the number of dentists.

Dr. W. G. Chase reported that there were eighty-three exhibitors. The clinics numbered ten, seven of which pertained to porcelain work.

The annual report of the State Examining Board was received, also the usual reports from the Standing Committees.

The Fourth International Dental Congress.

Two hundred dollars (\$200) was appropriated to the expenses of the International Congress, which was highly endorsed after some debate.

Dr. Charles A. Meeker was re-elected to the Board of Examiners.

This was another Ceramic Convention, with N. S. Jenkins as the star operator.

The Thirty-fifth Annual Convention, 1905.

President W. G. Chase called the Thirty-fifth Annual Meeting to order.

A letter from Dr. Stockton, who was unable to attend on account of illness, was read, congratulating the members upon the marvelous growth of the Society, the attendance of nearly eight hundred at the last conven-

tion, and the wonderful opportunities it presented to the dentists to take a post-graduate course.

The president in his opening address welcomed all members and visitors in the name of the Society to the Thirty-fifth Annual Meeting, and outlined the work of the various committees in preparing such an elaborate programme. He attributed our success to *hustle* and *unanimity* of purpose among the officers and members.



DR. W. G. CHASE
President, 1905

The question of the examination of the mouths of the children in public schools was advocated. A large supply of copies of the constitution and by-laws, code of ethics and State dental laws was recommended.

Seven applicants for membership were admitted.

Papers were read by Dr. Sinclair Tousey on the "X Rays and High Frequency Currents in Dentistry," accompanied by practical demonstrations. Dr. R. M. Dawbarn delivered a lecture on "Adenoids: True and False; Including their Bloodless Removal." Dr. A. W. Harlan read an unusually elaborate and edifying paper entitled "Food in its Relation to Teeth, their Sockets and Adjacent Structures."

These subjects were discussed by Drs. A. W. Harlan, St. John

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Elliott, V. H. Jackson, T. C. Stellwagen, G. L. Curtis, R. C. Brewster, L. C. LeRoy, Wilbur Dailey and others. Dr. W. H. Gelston reported for the Committee on Materia Medica. Dr. W. H. Williamson, of Aberdeen, Scotland, was accorded the privilege of the floor.

Forty-four clinicians were present out of fifty-four who were secured. Eighty-seven exhibitors were present.



DR. JOS. E. DUFFIELD
President, 1906

The Portland Dental Congress.

Greetings from the Portland Dental Congress were received and responded to in an appropriate manner.

Secretary Chas. A. Meeker's report for the State Examining Board was presented which stated that sixty-five examinations had been held during the year.

The reports of the Clinical Conference, Materia Medica, Dental Literature, Art and Invention, Prosthetic, Exhibit, Clinic, Executive and Membership Committees were received and contained information of great value and interest, which would fill an entire volume if printed.

Dr. C. S. Stockton was recommended for reappointment on the State Board.

The conventions of the last five years had assumed *mammoth* proportions, some of them surpassing in interest and attendance many

of our national gatherings. Indeed, it was not an unusual thing to hear such an exclamation from visitors as "I would rather visit the New Jersey State Dental Society meetings than the National Conventions." The exhibitors have repeatedly declared that the Auditorium is the best place to display dental goods in the United States, and that they receive the most liberal terms possible from a business standpoint.

The manufacturing exhibitors deserved unstinted praise for their artistic displays, and the untiring interest which they take in the success of the meetings of the New Jersey State Dental Society. They take a pride in this State gathering which is unparalleled in other States, and the reason is simple. They declare "that the New Jersey State Dental Society treat us better than any other dental organization."

The Thirty-sixth Stated Meeting of the New Jersey State Dental Society was convened by the president, Dr. Jos. E. Duffield. An unusual feature was the fact that the presiding officer came from South Jersey. Only four presidents have resided in South Jersey, namely: Dr. Geo. C. Brown, Dr. C. S. Stockton, of Mt. Holly; Dr. T. B. Welch, of Vineland; and Dr. Jos. E. Duffield, of Camden.

The president's address contained appropriate words of welcome, references to the needs of the Society and some practical suggestions, which precipitated lively and interesting debate.

The programme, which was elaborate, included five papers, one by Dr. Eugene S. Talbot, of Chicago, on "Therapeusis and Treatment of Interstitial Gingivitis due to Auto Intoxication," which was a revelation to even the progressive dentist in the line of practical research and the practical deductions therefrom. It made a profound impression on the convention. Dr. Talbot also gave a lantern lecture on the "Etiology and Pathology of Interstitial Gingivitis" in the evening, before an appreciative audience.

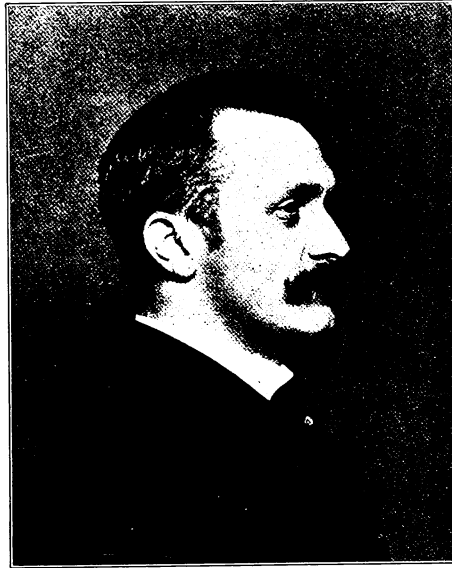
Fifty-three clinics, illustrating the most advanced ideas in dental practice, and sixty-nine exhibits displaying the latest improvements in equipments and inventions and supplies for the dentist, afforded ample opportunity to the profession to keep in touch with progress.

The Thirty-seventh Annual Convention of the New Jersey State Dental Society convened in the Auditorium at Asbury Park, N. J., July 17, 1907, Dr. M. B. Brinkman, the president, occupying the chair.

The most salient points referred to in the president's annual address consisted of an allusion to the low percentage of ethical practicing

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dentists in the State who belonged to the Society (which consisted at this time of 197 active members in good standing), while the books registered 1080 licensed dentists in New Jersey. Dr. Brinkman announced the decision of the Executive Committee to debar from the convention hall, resident dentists of the State, unless they were already members of the Society or had made application for membership.



DR. M. B. BRINKMAN
President, 1907

The president noted the "beautiful array of exhibits" which Dr. Walter Woolsey had secured. The Essay and Clinic Committees were especially complimented for their zeal and efficiency. He also particularly requested that the Society define the duties specifically of the Legislative Committee so that in the future there could be no question about the character or extent of their power. Other subjects of interest were referred to in a brief and business-like manner.

This address was debated in a witty and forcible way by Drs. R. Ottolengui, C. S. Stockton, Chas. A. Meeker, H. S. Sutphen, David C. Baker, R. W. Jewett, Wm. A. Jaquette, and Dr. Wright of Troy, New York.

Forty-seven applicants were elected to membership (making a total of 244 active members), thereby justifying the Executive Committee in the action taken, debarring resident dentists of the State, who were not prospective members, from the Convention.

Dr. F. C. Kemple, of New York City, read a paper entitled: "Orthodontia in Relation to the Development of the Bones of the Face."

Dr. Wm. H. Taggart, of Chicago, Ill., lectured upon the subject of "Casting Inlays of Gold Alloys and Other Methods," also "Combination Gold and Porcelain Inlays." Dr. Taggart also gave clinics upon this subject which were crowded with attentive and interested spectators.



DR. WALTER WOOLSEY
Elected President, 1907

"Taggart's Process," opened up a new epoch in the development of "Inlay Casting." It was not only a revelation but a revolution in regard to the art of "Casting," especially as applied to "Gold Inlays."

The History of the New Jersey State Dental Society was continued by Dr. A. Irwin.

These papers were discussed separately by Drs. R. Ottolengui, H. S. Sutphen, B. F. Luckey, Wm. H. Taggart, Wilbur M. Dailey, C. W. Valentine, S. C. G. Watkins, Wm. Gillette and M. I. Schamberg, of New York; Drs. Jos. Head and Wm. H. Trueman, of Philadelphia.

Dr. B. Holly Smith, another essayist, could not attend (owing to the serious illness of his son), to read his paper, entitled "Evolution of Dental Science."

The Committee on Oral Hygiene, consisting of Drs. H. S. Sutphen, W. F. Naylor and R. C. Fowler, was appointed to co-operate with the

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National Dental Association Committee in introducing the subject of oral hygiene among the pupils of the public schools, and inculcating the habit of taking care of the teeth.

Dr. C. H. Dilts reported that thirty clinicians were present, but an electric storm interfered for some time with their operations by cutting off the electric current. This was an unprecedented experience, as novel as it was inconvenient. Who ever heard of the New Jersey State Dental Society stopping their Clinics for anything or anybody?

Dr. Wm. H. Gelston presented the report of the Committee on Materia Medica.

The books and papers of the late Dr. Levy, were presented to the Southern Dental Society.

Dr. Jos. E. Duffield, reported for the Legislative Committee.

The report of the State Board of Registration and Examination in Dentistry was read by Dr. Chas. A. Meeker, which contained some innovations and showed decided advance in State Board work. Seventy-three applicants for licenses were examined.

Dr. Wm. E. Truex, of Freehold, was re-elected a member of the State Board.

Dr. H. A. Hull reported a balance of \$718.39 in the treasury.

The officers elected for the ensuing year were: Dr. Walter Woolsey, president; Dr. F. G. Gregory, vice-president; Dr. Chas. A. Meeker, secretary; Dr. H. A. Hull, treasurer; Dr. H. S. Sutphen, assistant secretary. Executive Committee: Drs. F. G. Gregory, Harvey Iredell, Chas. H. Dilts, W. A. Jaquette, W. F. Naylor.

Membership Committee: Drs. Henry Fowler, Wm. T. Thompson, Oscar Adelberg, Wm. H. Gelston, Thomas F. Martin.

The Thirty-seventh Annual Convention presented "Inlay Casting" as the greatest feat accomplished during recent years in the evolution of dental art.

The Detailed Technique for Making Dental Restorations on Artificial Stone Models.

By WESTON A. PRICE, Cleveland, Ohio.

Read before the Toronto Dental Society, October, 1908.

It is essential to a clear understanding of what is to follow, that you have distinctly in mind certain facts regarding the behavior of gold and all metals when cooling, which facts very largely modify our results, though not usually understood.

The facts are, first: That when pure gold is melted and allowed to cool, either rapidly or slowly, without pressure, it will contract 22.5 thousandths of its diameter in all directions, which is two and two-tenths per cent. The alloys of gold that we use contract nearly the same extent.

Second: This contraction is most rapid near the melting or freezing point.

Third: For considerable distance in temperature below the freezing point the metals and their alloys (varying according to the formulae) yield to pressure.

Fourth: The total contraction of a definite part of a cooling mass of any metal or alloy can be materially and definitely lessened by the application of pressure to another part of the same cooling mass. This causes most of the contraction to occur in one place where not objectionable. As the contraction takes place the mass is moved by the pressure at a certain point to replace the shrinkage taking place elsewhere, but this can only occur so long as the pressure is greater than the resisting strength of the mass, which for available pressure for our use is only a few hundred degrees. By this means we can, with one-fiftieth of an ounce actual pressure, reduce the total contraction in part of a mass of pure gold from 22.5 thousandths to 20.5 thousandths, and with one-tenth ounce reduce it to 18 thousandths. With three pounds we may reduce it to 14 thousandths, and with five and a half pounds to 13 thousandths. Remember that the actual pressure is not represented by the surface pressure per square inch of a gas pressing upon it. For a further discussion of the technical and physical phase of the subject, see articles in the May and June numbers of the *ITEMS OF INTEREST*, by the writer.

**Correction
of Contraction
of Gold.**

This is nearly the limit of correction we can hope to make by this particular method, and though it is a great deal, it is only about one-third of the total. Neither the shrinkage of 14 thousandths nor the total of 22.5 thousandths will be very noticeable

to the ordinary observer if the restoration is to fill a small inside dimension with a nearly round plug, as an occlusal inlay, but if it is to fit an outside dimension, as around a root or tooth, and is a strong metal that will not stretch, it will be very noticeable, for it will not go on without enlarging. All who have cast bases for porcelain teeth and cap abutments for roots know this, and it is because pure gold will stretch easily that they prefer it for that purpose.

The other methods for correcting this contraction are by modifying the alloy to have a minimum contraction (in which little has yet

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been done, but no doubt will be), and by either enlarging the mold so that the cast will be the correct size when contracted, or by holding the metal, compelling it to stretch when cooling, or both. The former can be accomplished by expanding a mold into which the cast will be made, and the latter only where the metal can be confined over a very strong form, as a ring around a very hard core.

The expansion of the mold has been accomplished to a certain, but not a sufficient extent, by heating an investment material, forming a mold and casting into it when hot. The best of these (see articles referred to) only allow of an expansion by this method of six or eight thousandths and most investment materials very much less, if not an actual contraction, on heating, and this class of material on heating, being chiefly silica and plaster has so little resistance or strength that it is easily distorted by high pressure, absolutely limiting the use of the first-named method for preventing the contraction, viz., by making high pressure on another part of the cooling mass, for they yield, producing beads and distortions on the surfaces, which, if on the cavity surfaces of the inlay, spoil it. The ideal conditions demand, then, that into the mold into which we cast, all surfaces that are to make contact with cavity walls and margins be so hard and strong that they will allow of high pressure without yielding, and should expand either when heated or upon setting, or both to increase its dimensions uniformly about 15 thousandths, which is one and one-half per cent. When casting upon this with an actual pressure of about two and one-half pounds we will have a cast within about one thousandth of the dimensions of the original.

A centrifugal casting machine, revolving five times per second in a circle of a diameter of ten inches, and with one-half ounce of molten gold, produces an actual pressure of almost one-half pound in the mold, one-eighth inch cross section situated at end of gate. At ten times per second, 2.14 pounds, and at twenty times per second, 8.56 pounds. An air or gas pressure casting machine, with sixteen pounds pressure per square inch on the sprue, produces something less than one-quarter of a pound pressure in a mold one-eighth inch cross section, situated at the end of the sprue or gate; at thirty-two pounds air pressure, about one-half pound, and at sixty-four pounds pressure, about one pound, not allowing for leakage of pressure past metal.

Effects of Contraction.	The percentage of contraction it will be of advantage to correct depends upon the size of the piece and where it is to go. A simple occlusal cavity with tapering walls and rounded margins over which a blunt knife edge of gold extends, can have the inlay cast with its full
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22 thousandths contraction or much more and do no harm, for by grinding the seat a little it only goes in the cavity enough farther to make an apparently perfect adaptation. If, however, the restoration is a mesial and distal filling, united into one piece through the occlusal surface, the contraction will prevent its going to place and to force it means simply to spread it out at the gingival margins, like spreading a horseshoe. It can not be corrected by grinding, for that would require grinding not only the surfaces making contact with the pulpal walls, but all the margins of both the mesial and distal cavities. These laws of contraction are constant and so are their effects: no matter what methods we use they must be compensated for, and unless our ideals are high, we will not always see them in inlay work. In bridge work, because of the length of the piece, the cooling contraction not only makes the piece too short to reach the abutments, thereby throwing one of them out of register, but, if the attachment encloses the foundation as a ferule for a root, its decreased diameter will not allow it to go over. The bridge will also be too short at the surface making contact with the gum tissue. For this reason it has been necessary to assemble bridges in sections.

Another and very desirable quality in the material on which we construct our work is a strength and density that will permit us to assemble and finish our work as though it were in place in the mouth, but without the inconvenience of the surrounding parts in our way. I believe all of these advantages are provided in this artificial stone model material and method, as we will demonstrate.

Price's Artificial Stone.

Being a silicate cement it is manipulated precisely as they all are. It should be mixed with a large stiff spatula, as large as a dinner knife, made preferably of German silver, and the powder worked very thoroughly into the phosphoric acid in small portions at a time. It sets in a short time, but can be hardened quickly by heating. It is made in different qualities for different purposes. That for record or display models, white and very hard and with a minimum of expansion or contraction. For inlay models, hard and strong enough to polish upon, but can be broken up to remove the inlays. This is made with different degrees of setting expansion (as strange as this may seem for a silicate cement) for different uses, as will be demonstrated and explained later, and a grade with a slight contraction for modifying the others. After setting, they should each be baked to a dull red to harden. It has been a great gratification to be able to develop a fixed expansion in a cold model after being baked to a temperature of 2000 degrees of eight and ten and even twenty thousandths. When red-hot this expan-

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sion is about twenty-seven thousandths. This is especially important since the silicate cements on the market all have a large contraction, generally from twenty-five to forty-five thousandths, on setting before being heated, and much more after heating. The most extreme heat of a gas and air blowpipe does not injure the artificial stone, which fact makes it available for fusing gold and platinum alloys and porcelain upon it. Experience has shown that with careful and skilful handling it can be placed into very complex impressions without requiring the hydraulic press previously suggested.

It is applicable for the construction and finishing of gold inlays, for gold and platinum inlays, combination gold and platinum and porcelain inlays, porcelain inlays, all porcelain crowns, gold base porcelain crowns, bridge abutments, bridges, removable bridges, gold plates, swaged or cast aluminum plates, orthodontia appliances and retainers and in rubber work.

Cavity Preparation for Inlays.

We will observe in some detail its use in gold inlay work. Space will not permit of a detailed discussion of the proper technique for forming cavities, except to emphasize that the same rules that are recognized for malleted fillings, relative to anchorage, must be observed. There must be locking dovetails or anchoring seats sufficient to hold the inlay in place even without cement under any load which it may receive, and the cement is simply the key that locks it. No more cutting or separation is needed for this method than any other inlay method, and an impression can be taken of practically any cavity into which a finished filling can be inserted.

For preparing cavities, the square end and slightly tapering spiral crosscut fissure burs are especially serviceable; also the rapid cutting stones of various shapes, particularly the assortment put up by the Chicago Wheel and Mfg. Co., Chicago, Ill. As for all methods of inlay work, every part of the cavity must draw. If there are undercuts they must be filled with temporary stopping or other suitable material.

There are a few good impression materials, but such compositions as Perfection Impression Compound and Magnifique are not suitable on account of the mineral earths they contain. We require something that will burn off clean as well as take a smooth detail impression. I expect a good material and probably the best so far available will be put on the market with the stone; however, good results will be obtained with White's crown sticky wax, the dark orange color.

The special tray to use for each particular case will depend upon the cavity and will be discussed later, and is very important.

**Technique
of Making the
Stone Model.**

The stone model is made in the impression by packing little bits of the mixed stone in the deeper parts of the impression with a small pointed spatula and working it along to positively drive out every bit of air. If necessary, it can be placed at once, or in a few minutes, over a slow heat to hasten the setting and melt off the wax impression, after which it is heated to a dull red heat to harden. As soon as cool enough to handle it is ready to build the inlay in. It is sometimes desirable to take an extra impression and make an extra model of each case for the convenience and advantage in polishing, to show the exact position and shape of the margins. This is an advantage you cannot have when finishing any kind of a filling in the mouth.

A print of the opposing tooth or teeth is taken by having the patient bite into a piece of warmed tough base plate beeswax. The occlusion is either determined from this by the eye, or by making a stone model in the side opposite the cavity and using this to articulate with the cavity model as will be shown later.

The majority of inlays will be cast directly into the model, but small occlusal or buccal cavities having all walls present can be made more quickly by packing with gold and platinum foil, taking care that it laps on all margins and then flowing pure gold into it. The gold settles into gold like water into a sponge. The filling is then polished on the model as though it were in the tooth.

The other method of procedure is to build into the cavity in the stone model, a filling of wax. Use any good beeswax base plate, transparent preferred. A warm spatula is used and the wax, colorless preferred, is melted and carved to suit. You cannot appreciate, until you have tried both, the difference in making by melting in a dry model outside the mouth a wax filling that is to remain in the model; and making, in a wet cavity, in the mouth a wax filling, which must be removed without distortion. There is simply no comparison in the ease, simplicity and exactness. A headless pin or piece of small wire is heated and inserted into the wax filling, preferably at a point where there is not a contact to be preserved, and this pin placed in the hole in the taper form making the sprue gate and attached with a very little sticky wax, and the whole, model and all, invested in any silica and plaster preparation in a suitable size cup, which preferably is a tube with a removable bottom. After drying out, which forces the wax out by the steam generated behind it, for the wax does not settle into the stone model, nor can it flake off, the whole is heated to expand the mold. Do not be

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afraid that expansion will make the cavity or mold smaller; it works just the same as heating an iron wagon tire which the blacksmith heats to expand it to place on the wheel, where he allows it to cool and contract to tighten.

The casting of the gold, or gold and platinum, or other alloy desired, can be done by any desired method and with the advantage that it is impossible to distort the cavity surfaces or margins of the inlay by any pressure you can use, and these surfaces will be glossy, smooth as they come from the stone model. If the silica and plaster investment yields at any point it does not change the fit of the piece, for any beads, etc., in that surface are removed in the polishing, which after cutting off the sprue gate you are ready to do. It is always very important to use a high and continued pressure in casting to reduce the shrinkage, provided you have a cavity surface in your mold dense enough to permit it, which the stone does, but which unfortunately the silica and plaster and similar compounds do not permit. The continued pressure is essential so long as the gold is yielding, but after the gold is cooled too stiff to yield to the pressure used, it will have, no matter who does it, nor what method he use, precisely the contraction that it or any other piece of the same metal will on being heated from normal temperature up to that point, which is approximately one thousandth for every hundred degrees; except only when the gold forms a ring around a solid core or similar confined shape which stretches it.

Advantages of Stone Models.

The advantages in polishing the piece on the stone model reproduction of the tooth cannot possibly be fully appreciated until you have experienced them for yourself. You cannot distort the margins, which you cannot entirely help doing when holding the inlay in your fingers. You cannot, if thoughtful, polish off too much *without knowing it*, for the stone tooth and articulating model show precisely the ideal and essential shape and contours, even better than in the mouth, where, for example, the adjoining tooth and cheek and gums, etc., cannot be removed to give access to the gingival and other margins. This finishing cannot give discomfort by getting hot, as neither you nor the patient is touching it, and the stone model is a poor conductor of heat. It cannot fly from the polishing disk or stone, as when polishing when holding it in your fingers. It is seldom that so high ideals of form could be secured if polished in the mouth, and yet the patient is saved all that discomfort.

The removing of the inlay from the stone model is simple, but requires judgment. Take a pair of wedge cutters or wire cutters, with

knife jaws set at about forty-five degrees to the handles, and fracture the tooth, carrying the inlay, from the model after fracturing off the adjoining teeth. Then, without touching the inlay, cross fracture the stone tooth in a direction where it can separate without being locked by the filling. A sharp excavator will fracture and loosen any clinging pieces, and it will remove as clean and bright and smooth as if coming from a metal surface, and bear every scratch or line of the model. If the inlay has been fused in the cavity by the blow pipe method, the contraction being the full extent, the inlay will usually drop out; also if cast with a very low or brief pressure; but if cast with a high sustained pressure it cannot be removed without fracturing the model.

After removal, it is essential or desirable that cross anchorage, grooves or undercuts be ground in the cavity surface in such positions as to allow the cement to lock it into its seat, but, as before stated, the form of the cavity should be such as not to depend upon the cement for anchorage.

In cementing it is not necessary to apply the
Cementation. rubber, which, incidentally, is also seldom necessary for the preparation of the cavity, except such cavi-

ties as the sensitiveness requires, the application of cocaine by cataphoresis where high pressure anesthesia of the dentine is not convenient or painful. The writer has found indispensable for setting inlays or bridges in the lower arch a simple instrument that holds both the cheek and tongue away, and a saliva ejector at the same time if desired, giving the effect of two of the Nyman instruments in one.

The setting of inlays in the upper arch can be accomplished in almost any case with a small roll or pad of bibulous paper between the teeth and cheek or lip and the saliva ejector. Have the cement mixed thin or the inlay cannot be inserted entirely to place and proceed at once while the cement is soft, but still dry, to go all around the inlay and burnish all the margins tightly to the tooth, including the gingival, while holding the inlay firmly in place. There is no reason why these margins, if pure gold, cannot be burnished as closely, if the cavity is properly formed, as a malleted filling, and an inlay that shows a cement line at any point is not up to a high ideal easily attained by this method.

I confidently believe, from careful observation and experience, that very much more perfect margins can be secured by this method than by any heretofore suggested. For burnishing the occlusal surface margins a very smooth round steel burnishing bur, rotating in the engine hand-piece, is excellent; also exceedingly fine grit stones that will not scratch, followed by oval headed or other hand steel burnishers. The burnisher will harden the surface, which should be done with all gold fillings, mal-

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leted or otherwise. A mat surface can be given for a finish, with a fine cuttle-fish disc if desired after the burnisher.

Impression Trays. There are some special trays and special methods desirable for the various cavities. The best trays for simple occlusal cavities having all walls are the fingers or thumb. Take a piece of the hard impression wax suggested, not a beeswax or paraffin wax, large enough to fill the cavity

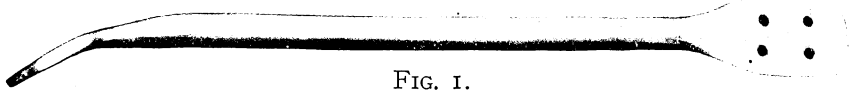


FIG. 1.

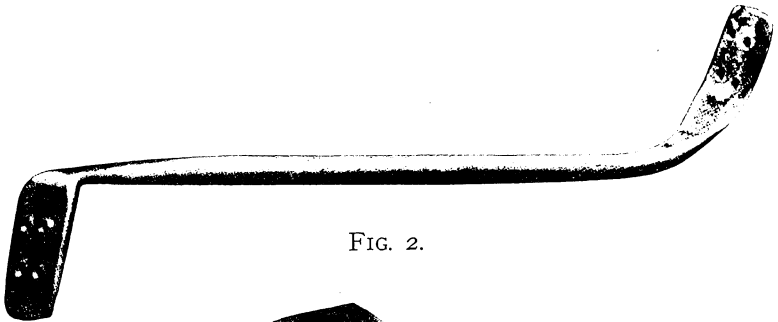


FIG. 2.

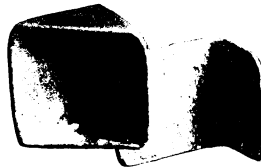


FIG. 3.

and also cover the entire surfaces of the crown; warm to a yielding stage and shape like a cone or wedge; wipe or blow the excess of moisture from the cavity, and after softening the tip press into the cavity, and after placing the saliva ejector in the mouth throw a stream of cold water on to the impression and chill and remove. This spray should be connected to the cold water supply, and the saliva ejector should have a large capacity, large enough to take water away faster than the spray supplies it. If the cavity is far back, or on a buccal or gingival surface, the impression cone is more easily handled by warming its base slightly and sticking it to the ball of the finger to carry it to place. Impressions of exceeding exactness can be quickly taken by this simple method.

For cavities on the distal surfaces of third molars and some buccal and gingival cavities very close to, or under, the gingival tissue, the

wax cone, or wedge, or ball, is attached to a suitably bent bar for a handle with a flattened or spoon shaped end to support the impression material. Figs. Nos. 1 and 2 show a variety of shapes. I have here a number of practical cases to illustrate these various cavities, taken during the last week or ten days. They show generally an impression in the tray, if one was used, a stone model of the case and a finished filling in another stone model of the same case, and the occluding model

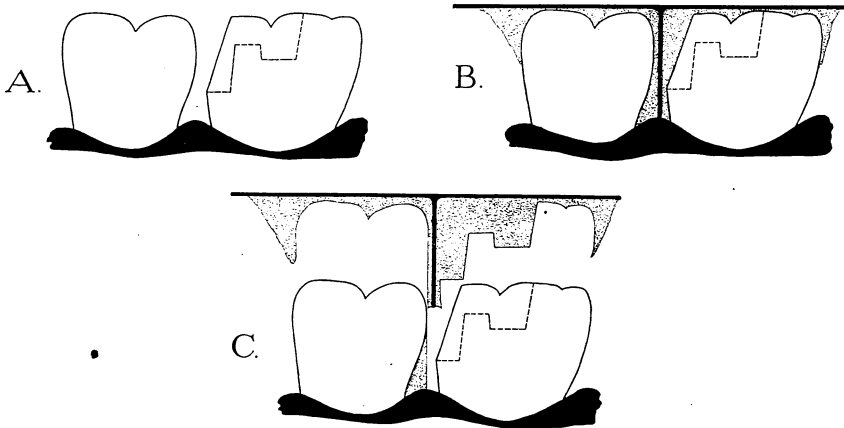


FIG. 4.

if one was needed. These will all be inserted at the early visits of the patients on my return, probably all within a week. You will see by the cards that many of them are for children.

Whether these inlays should be cast or fused into the stone models made from these impressions will depend upon the size of the cavity and difficulty of obtaining the contours.

For approximal cavities involving the occlusal surface, but without a contact with any adjoining tooth, as the disto-occlusal of third molars, or where approximal tooth is absent, the impression material is supported by a tray shaped like the letter, L, with or without one or both sides closed. Both are shown in Fig. 3.

For approximal cavities, either one or two adjoining, the technique is slightly more difficult, but no less exact in results. We will first consider one approximal cavity with a normal contact with the adjoining tooth. An impression can not be taken of the cavity and the adjoining tooth surfaces without distorting the impression on removal if made by simply pressing the material into this space (see A, Fig. 4), because of the undercut under the contact point of the adjoining tooth.

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This is overcome by placing a septum on the tray to pass between the teeth (B, Fig. 4), and support the impression material and prevent any distortion on the cavity side of it on withdrawal, while the wax in the undercut below the contact point is drawn off on the removal of the impression without any disadvantage to the impression. (See Fig. C, No. 4; the trays are made with one or both sides enclosed, Figs. 5 and 6.)



FIG. 5.



FIG. 6.

After the stone model is made, which reproduces the cavity and the adjoining tooth and its contact point with exactness, the contact point is polished slightly before the gold is cast against it, in order that there may be a little excess gold at that point for polishing, and that there may be a firm pressure at this point when the finished inlay is inserted in the mouth. The wax filling is built into the cavity and the gold cast into it usually before this tooth is removed from the model, which is done to allow of polishing that surface and the gingival margins, which thereby become easily accessible.

A record of the occlusion having been taken by the bite in a suitable base plate wax, the antagonizing or occluding model made of the stone gives accurately the exact occlusion. A very great advantage of this material for all occluding antagonizing models is the fact that its hardness allows of hard pressure being used or a grinding motion applied without danger or possibility of defacing the cusps or surfaces, unlike any material we have heretofore had, except by casting the opposing teeth in metal. This will be a boon to all prosthetic workers, for with it porcelain teeth can, when grinding, be forced to their place in crown, bridge or plate work.

Where there are two approximal cavities the technique for the impression is the same, and in all cases we endeavor to secure exact information of only the surfaces desired, in order not to allow the impression material to extend into undercuts in or between other teeth,

its removal from which may distort the cavity impression. In case of two approximal cavities the model is separated by fracturing between the teeth before the wax fillings are built in them, for the purpose of giving free access to the gingival margins for contouring and forming and finishing them in the wax, and to allow of a slight excess being added to the contact points, both for polishing material and for a slight pressure at this point when the fillings are inserted. Our former

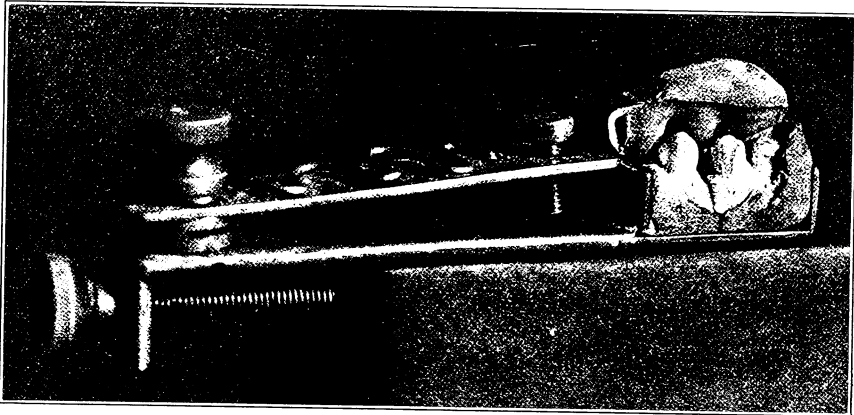


FIG. 7.

method was to depend on the placing of the fractured surfaces of the model together to determine when the correct excess of wax had been added to the contact points, but usually too much was added, when only a few thousandths of an inch were needed. I have designed a very simple but efficient and exact instrument for this, which allows the amount of this addition to be determined and gauged with accuracy. (See Fig. 7.) The stone model when made is placed in between the short, square supporting walls, bounding the flat surface or seat of the instrument and allowed to set. After setting and baking it is fractured through between the teeth that have the approximating cavities and replaced in the instrument. These end walls are now separated a definite distance by means of a micrometer screw. This keeps the teeth in exact relation, except for being separated a few thousandths of an inch, and even after the fillings are cast and polished the stone models with the fillings can be placed in it and the exact additional pressure at the contact point measured. This instrument is also arranged to mount the occluding model as an articulator and with all the motions of mastication. One of these instruments, as I show it to you, has the completed fillings for approximal cavities in upper right bicuspid,

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shown in Fig. 7, and another has the foundation and occlusion models of a lower left third molar badly broken down, but prepared for a large gold inlay. With this instrument, with the articulator attachment, it is possible to get exceedingly accurate contact surfaces of the inlays direct, without grinding in the mouth. On the bottom of this micrometer gauge articulator is a Vernier scale reading directly in thousandths, which always gives to that accuracy the expansion or contraction of

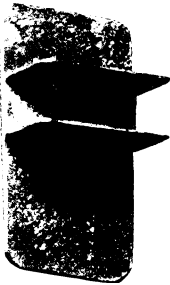


FIG. 8.



FIG. 9.



FIG. 10.

the stone model material. I have in this way made the fillings for several adjoining teeth, involving all of the mesial and distal surfaces of the first and second molars, and the distal of the second bicuspid, the mesial and distal fillings united into one filling in each of the molars, and the contact points and occlusion were so perfect on first trial as to need exceedingly little relieving. The restorations for contour occlusion and contact were more perfect than I have ever seen in malleted fillings, and I believe much more desirable. These cases require great care in the preparation of the cavities to allow all to be taken in one impression, and it is only possible where the teeth stand in quite normal position, and of course where very extensive decay has taken place. The stone model is divided between each of the teeth, so they can be handled as single teeth. I will pass the models, showing a case, before and after, of a nervous girl, age about thirteen years, who has never been able to have gold fillings malleted, yet had all these cavities prepared at one sitting, and the impression taken and the inlays all inserted at the next sitting, and she was probably in the office less than one hour for each sitting, and it would have taken several hours by the best operators to have malleted all of them in, to say nothing of the time and discomfort of finishing and polishing them.

We frequently see bicuspids with only the lingual and buccal walls,

and, while these are strong, there is danger from malleting against them. These cases are very satisfactorily restored with gold inlays that protect and strengthen these walls and yet are not unsightly. This permits of postponing for a long time the porcelain crown, which requires the destruction also of the pulp. For taking an impression of these cases a tray with two septa is used, which preserves the exactness of the impression of that tooth and gives the contact points accurately. This tray is shown in Fig. 8. One of these septa is also made adjustable (Fig. 9).

Because of the added strength of cemented inlays to frail walls, as compared with malleted fillings, this method is exceedingly well adapted to restoring the incisal angles and edges of the anterior teeth. The tray I use for taking these is very simple, being a V-shaped piece like a short trough, which supports the impression splendidly. The advantages in contouring and finishing are apparent to any one by inspecting these models with and without the finished inlays. Fig. 10 shows one of the trays. For these restorations I generally use from two to five per cent. of platinum in the gold for greater density and wear. Of course where the gold will be conspicuous or unsightly this method must be modified, which is done by making one of the most satisfactory and esthetic operations I have ever seen, which is to cast the gold and platinum inlay with a cavity in the labial surface which shows, and after polishing the filling on the model, bake into this cavity in the gold and platinum a porcelain inlay to match the shade of the tooth. A very thin wall of gold is left at the edge of the margin of the cavity and undercuts are made in the gold to lock the porcelain. These inlays are very desirable and serviceable; they have all the strength of an all-gold angle, with all the good appearance of an all-porcelain restoration. You can appreciate this from the practical cases being passed. In some cases, where I do not want the gold line to show, I cement the gold inlay with its unfilled cavity in place and take an impression of the cavity and make a porcelain inlay to go into the gold inlay.

I believe these operations will solve the problem of the incisal angles of the anterior teeth, and buccal cusps of bicuspid.

Stone Model in Porcelain Inlay Work.

In some cases where there is no strain on anterior teeth and where the restoration involves a large part of the labial surfaces, as where the enamel is deficient from sickness in early childhood, an all-porcelain restoration may be indicated. The stone model fills a long-felt want for these difficult restorations, which are chiefly troublesome because of the difficulty in securing exact contours and angles.

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By adapting over the tooth a sheet of exceedingly thin, soft platinum foil that will adapt with very close accuracy one five-thousandth or less, and placing the impression wax over it and pressing into the cavity, and at the same time taking the adjoining teeth, a model is secured with the platinum in place on which the porcelain is built and molded, baked and ground, and rebaked, with the advantage that all the time, as in the cases of either the gold tip or the combination gold



FIG. 11.

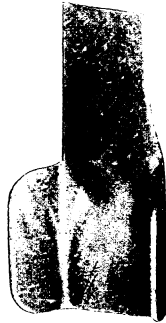


FIG. 12.

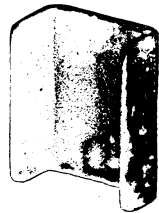


FIG. 13.

platinum and porcelain tips or angles, the operator has the adjoining teeth in place to show the size, length and contour, etc., and the platinum can not become distorted. The operator has only to refer to the mouth for the shade. These joints are exceedingly close, and the contours the best I have ever been able to make. You will see the advantages from the cases being passed.

Approximal Cavities.

The cavities in the mesial and distal surfaces of cuspids and all the incisors are especially difficult to take impressions of where, as is usually the case, the incisal angle is not gone. These cavities are usually prepared from the lingual surface. The impressions can be taken in platinum foil, first adapted and removed and annealed, and then placed again in the cavity with a hard wax, like sticky wax, in them to support and strengthen. These are chilled and removed and mounted on the stone, and the filling fused or cast into them and polished on the model. Another excellent and, I think, new method, is as follows: A special tray with a thin septum is used and with the impression wax pressed to place the septum protruding through. This gives the lingual and approximal surfaces and the cavity form, but not the labial surfaces, which are secured by replacing the impression and taking a labial impression over the moist protruding septum. After this is chilled the impression removes in two sections, and as you will

see from this case with all the steps, the result is very satisfactory. The tray is shown in Fig 11. Figs. 12 and 13 show trays for taking impressions of compound buccal or lingual with occlusal cavities.

Before discussing crowns and bridges I wish to show you some rings, cast from wax rings, made to just pass over this taper column, which has a slope to represent twenty thousandths to the inch. A pure gold ring, fused to this size as accurately as possible, without pressure, lacks more than one inch of passing down to the base. Rings cast in plaster and silica molds and in the best investments on the market, even when heated, will only go to within about three-quarters of an inch of the base, and a ring cast at the same time, in the same cup, but on another branch of the same sprue, with the same size gate, but with the artificial stone placed in it for a hard core to prevent the contraction by stretching the cooling metal, which the plaster and silica preparations are not strong enough to do, passes to the base of the taper column. They are left attached to the sprue to show that they were cast at the same time, and hence, under precisely the same conditions, except the stone core. I have made them over a stone core with sufficient expansion to allow them to drop freely off the base of the column. The contracting strength of gold is enormous.

Those who have done crown and bridge work know how the teeth will not go into the sockets cast for them without grinding the tooth or stretching the socket, which latter was only possible with pure gold, and the band would not go over the root. By placing this artificial stone of an expanding quality in these chambers when casting, the metal is held or stretched on cooling, preserving the dimensions. This is shown by the gold and platinum base porcelain bicuspid crown being passed. The gold base is made by taking the adapted crown, with thin platinum foil over its base to prevent the wax from sticking to it, and with the iridio-platinum post in position in the crown pressing with the warm wax over the pin and base of the crown into place on the root.

After chilling and removing and trimming the tooth is removed and the stone placed in both the tooth seat and the root seat, and after it is hard the wax is polished and invested and cast. These crowns go with exactness to place, as no others have ever done for the essayist.

The entire construction of gold-base porcelain crowns can be accomplished by taking the impression with the two septum trays shown in Figs. 6 and 7, with the post in position in the root when the impression is taken. This, with the occluding model, gives with exactness all the relations for completing the crown, and gives very exact results.



The Possibilities of the Separable Pin Crown.

By F. W. HANCOCK, Chicago, Ill.

Read before the Scandinavian-American Dental Society of Chicago, 1908.

That nothing succeeds like success is proven by the fact that six of the leading tooth manufacturers of the world are now engaged in the manufacture of separable pin crowns.

When tooth manufacturers decide to place a new crown on the market, it necessitates an investment of many thousands of dollars, for molds, labor, etc., and it therefore behooves them to be sure of their ground before indulging in such expenditures.

The form of crown, underlying principles of the fusing of porcelain, details of manufacture, tests by dentists of experience, opinion of dealers as to demand, opinions of dental salesmen with their facilities for comparing clinical experiences of practicing dentists, all must coincide with proven experience, gained in the manufacture of porcelain teeth.

When the conservative firm of Claudius Ash & Sons Company admits the correctness of the principle involved, and places a separable pin crown on the market, we may regard it as an omen and look for the reasons, chief among them being ideal conditions in fusing, owing to the absence of metal in any form.

The individual porcelain worker fails principally because of the nature of his work. It frequently calls for exactness to a minute degree. Shrinkage of a thousandth of an inch means failure and shrinkage in the fusing of porcelain is inevitable.

This is also true of the fusing of the separable pin crown, but as the same degree of exactness is not a requisite, the inevitable shrinkage results only in reduction of bulk for which allowance has been previously made.

It was early discovered by the individual porcelain worker that the shrinkage of his porcelain at the sharp angles of a square pin caused fracture, and a round one was substituted to advantage; but unequal expansion and contraction of metal and porcelain could not be overcome, and as a consequence porcelain bridge work is a thing of the past.

That the absolute failure of this work, beautiful as it was in appearance, is due to the cause assigned, is proven in a scientific article by Clarence J. Grieves, which appeared in the March *Cosmos* and from which the following is taken.

"After considerable experiment in honing—grinding again being avoided as damaging to the character of the porcelain—a number of fac-

ings were obtained without pins, measuring within 5 mm. every way the same as a similar number with pins; out of these, four were carefully mounted and exposed in pairs to a crushing load of 435 lb. per minute, with results as follows:

MOUNTED IN CEMENT.

Total Length.

A, pinned	6.25 mm., failed at	338 lb.
B, without pins,	6.21 mm., failed at	1067 lb.

MOUNTED IN PLASTER.

Total Length.

C, pinned	6.25 mm., failed at	135 lb.
D, without pins,	6.20 mm., failed at	349 lb.

These are a few from many tests, all proving that porcelain fused alone, and free from the internal expansion and contraction stress of the contained metal pins, is at least three times as strong as when such conditions are present.

The irregular heating of porcelain, such as ordinarily occurs in investment, damages its tensile strength, there is great loss of resilience, and the material is less dense and more friable. When pins are present this damage is pronounced.

Out of a number of facings honed to equal bulk, four were selected. Those lettered F and H were not heated, while E and G were invested as for ordinary soldering minus the backing, exposing the backing side of the facing and investment to the blowpipe flame until 20 karat flowed on the edges of the investment, but did not touch the facing. After carefully tempering down, these were exposed in pairs to the same stress as in the previous test, with the following results:

MOUNTED IN CEMENT (*all having pins.*)

Total Length.

E, heated	13.0 mm., failed at	367 lb.
F, not heated	13.2 mm., failed at	1144 lb.
G, heated	13.8 mm., failed at	359 lb.
H, not heated	13.4 mm., failed at	1121 lb.

Thus, it is plain that a facing containing pins, simply heated to the fusing point of gold solders, is only one-third as strong as the same not heated; it is obvious that the expansion and contraction of flowing solders applied on the backing would add materially to this stress.

Are not these facts and figures sufficient to warrant the prophecy that the cast bridge with cemented crowns or facings will be the bridge of the future?

Your experience in repairing rubber plates bears out Dr. Grieves's statements. In repairing plates, you are seldom called upon to replace

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broken molars or bicuspid. The lateral is the oftenest replaced, for the reason that it contains insufficient porcelain to overcome the weakening influence of the pins.

The porcelain jacket crown furnishes additional evidence in this direction. Whatever else may be urged against them, insufficient strength has never been mentioned either by those who advocate or condemn their use.

It should be remembered that the average thickness is not more than a millimeter. The reasons for the unusual strength developed are proper conditions in fusing, absence of pins or bars, and perfect adaptation. Maximum strength of porcelain and perfect adaptation may therefore be accepted as the underlying principles of permanent porcelain crown and bridge work.

The Writer's Personal Experience.

My experience as a patient will serve as an illustration. For two years I wore a Richmond crown, the band of which was accurately fitted. It represented two hours' work by one of our leading prosthodontists. It was a beautiful piece of work, but after a few weeks I found myself favoring it because it had developed a weakness which I could not define at the time. I am now convinced that the crown being subjected to strain, either band or pin, perhaps both, had stretched. It was of little service thereafter. Finally, I bit on a piece of tough lemon peel, the crown gave sufficiently to permit the introduction of the thin edge of the wedge, and the face of it shot across the table.

The one which replaced it was fitted with Roach's moldable porcelain. The comfort and usefulness of it led the writer to suggest that dentists send for patients, take off Richmond crowns and replace them with crowns constructed in a similar manner.

You may realize that a crown made in this manner is the most useful and satisfactory, but you can never realize it like one who has worn both kinds.

Cast Bridges.

Those who have worn crowns, either banded or with plain dowel, will agree that the practical value of a porcelain crown depends upon its being held rigidly to its work. The slightest lateral movement impairs its usefulness.

With the use of the Taggart casting method, in conjunction with separable pin crowns, difficulties heretofore considered insurmountable are removed. As has been proven, porcelain is furnished at its maximum strength; correct metals may be used and perfect adaption secured.

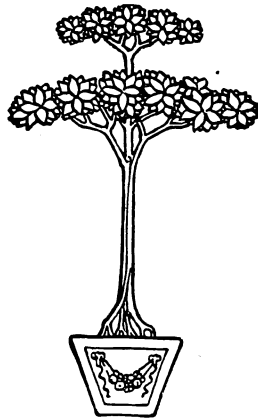
To emphasize the value of correct material, take a lower case with six anterior teeth in position, the others missing, replace them with a partial gold plate. It is common practice to connect by running a sixteen

gauge iridio-platinum wire from side to side. The value of the plate is largely dependent upon the rigidity of the wire, yet thirty per cent. iridio-platinum wire, which is much stiffer than anything else procurable, is practically unknown.

The separable pin crown in combination with casting enables the operator to take advantage of every point in his favor. Instead of being hampered by the limitations of 22 k. gold, with its tendency to stretch, either clasp gold or a stil more rigid material may be used.

As one dentist has put it, perfect work of this character is an incentive for charging higher fees.

My conclusions are: First, the nearer a porcelain crown approaches the fixity of the natural tooth, the more serviceable it becomes. Second, porcelain properly fused under favorable conditions has sufficient strength to resist ordinary stress, provided the adaptation be perfect and the pin correctly shaped. With the present facilities for casting, the splendid results achieved with a porcelain jacket crown may be duplicated with separable pin crown, both in regard to absence from fracture and recurrent caries. Fourth, that the porcelain manufacturer has practically abandoned the development of the fixed pin crown for that of its more adaptable peer.





Under date of September 22d, a circular letter was mailed from Washington signed by five of the leading dentists of that city, making an appeal to the profession at large to subscribe to a fund to be used in defending Dr. George W. Boynton in a suit brought against him by Dr. William H. Taggart, of Chicago.

Since then I have received a very large number of letters in regard to this controversy, some from gentlemen known to me by reputation only. In the main they have been copies of letters which the writers had sent to Dr. Finley, the treasurer of the Boynton defense fund, refusing in emphatic terms to contribute. A few have urged that I point out to the profession the unrighteousness of banding together to deprive Dr. Taggart of his just rewards under his patents; while still others have pointed to my "past record in opposition to process patents," and have suggested that I ally myself with the new movement.

In these circumstances I have thought it proper to investigate impartially both sides of the case, in order that I might prepare and publish such a statement as will truly inform our readers of the facts. To this end, I wrote to the Washington committee, offering to meet them personally in Washington at a conference, and promising if they would convince



me of the correctness of the position taken, to lend the aid of ITEMS OF INTEREST to their cause. This offer was not accepted, and having been denied the opportunity of personal discussion with the members of the committee, I am compelled to study their position from their printed circular letters, two more of which have just been received. In addition, however, I have seen a number of letters written by the treasurer of the committee to men who had declined to contribute, so that I fairly comprehend their position.

On the other hand, I wrote to Dr. Taggart for an open expression of his intentions, and knowing his aversion to letter writing, I suggested that perhaps it would be as well if my letter should be handed to his attorneys for answer. In this manner I received a letter from Dr. Taggart's attorneys, which contained information very surprising to me, and which I believe will be equally a revelation to the profession at large, for which reason it will be quoted.

**Position Taken
in the Past on
Process Patents.**

Before discussing the present, I will here, as briefly as possible, review the past, in order that those interested may learn, what does not at present appear to be well comprehended, that I have constantly and consistently fought for an important principle, which I have never abandoned, and which I do not now intend to abandon. In brief this is, that the federal government should not grant any patent on any process of treating human disease.

In March, 1897, the movement to prohibit the granting of process patents was inaugurated in an editorial from which I make a few quotations:

"As to whether it should be considered professional or otherwise to take patents, is worthy of some consideration. As being in a sense the act of a tradesman, and therefore the antithesis of professional spirit, it has been held, especially in the medical world, to be unprofessional. But in this age of progress, it is time that musty old doctrines should be revised to meet the modern advance of thought. Sentiment should have less force and reason should hold sway. This does not mean that ethics should be set aside; but ethics, like all science, for ethics is a part of social science, is or should be subject of discussion, and if need be, of alteration."—pp. 204-5, 1897.

"It is therefore a short-sighted policy, and opposed to the welfare of the professional body, to cast ethical reflections upon the medical or dental inventor who takes patent upon an article of manufacture, which, when produced, is offered alike to all at a uniform price."—p. 205, 1897.

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"But when one man discovers or imagines he discovers a new method of procedure in practice, it should not be legal for him to exact tribute from all that use that method."—p. 206, 1897.

"With a man who claims a patent for a process it is different. He furnishes to the practitioner nothing but a set of directions."—p. 206.

"The Protective Association has done a holy work in fighting patents. . . . But there never should have been any need for such co-operation of dentists, nor for the expenditure of the money which it has required. The profession should unite in a request to Congress for the passage of a law prohibiting the granting of any patent, upon any method or process of treating or curing human disease."—pp. 207-8, 1897.

Thus eleven years ago I argued; First, That it is not unethical to take a patent. 2d. That patents of one class are advantageous. 3d. That process patents, of the kind specifically described, should not be granted. 4th. That Congress should be petitioned to prohibit such patents. But nowhere do I claim that a dentist should count himself a member of a class, privileged to disobey laws which are binding upon other citizens.

About this time I sent a circular letter to all State societies, asking an opinion as to the advisability of making an appeal to Congress to change the law. As Correspondent of the New York State Dental Society, I reported all replies, only one of which was a declination to co-operate in a movement which if successful would make it forever impossible for any one to harass our profession with one of these obnoxious patents. Oddly enough, this refusal came from the dental society in Washington, D. C.

Dr. J. N. Crouse, head of the Dental Protective Association, was present in Albany and took part in the discussion of this Correspondent's report, and to the utter astonishment of many, antagonized the scheme, which, however, was approved by the society, and later a proper bill was drawn and introduced into Congress. A copy of this bill may be found on page 284 of ITEMS OF INTEREST for 1898.

In January, 1898, I published an editorial appeal to the profession for co-operation, in which appears the following:

"There must be no confusion in mind in relation to the class of patents which we wish to see abolished. Whatever may be honestly invented and subsequently manufactured and sold, is a legitimate subject of patent. Even a method or process may be properly patentable where it is a method or process of manufacture, the product being placed on sale at a common price to all."



Next, the editor of the *Digest* wrote an editorial in opposition to our appealing to Congress, from which I quote the following:

"From the January number of *ITEMS OF INTEREST* we see that the imaginary reform is still being pushed, and that the Correspondent is not only bound to continue in his folly, but is in a fair way to make the profession a subject of ridicule, by securing aid from the different societies in a movement which is sheer nonsense."—*ITEMS OF INTEREST*, p. 215, 1898.

In reply to this editorial, in which Dr. Crouse agreed with the Washington dentists in their claim that methods of treating disease are not patentable, I quoted many such patents, of which I then said: "*These inventors have nothing for sale. They manufacture nothing. They supply the dentists with nothing beyond directions.*"

In the same editorial I criticised Dr. Crouse for attacking dental patents on the ground of invalidity, spending thousands of dollars of the profession's money trying to prove priority, but not expending a penny to advance the more important principle that dental processes are not, or should not, be subject of patents. And as long ago as 1898, when the Taggart process was not even dreamed of by the profession at large, I used the following language, which at present reads almost like a prophecy:

"Then a wise man appeared in the West. A man with a purpose, a man with a will. He advised the dentists to offer organized resistance. To associate together and to subscribe ten dollars each to a fund for mutual protection. Thus was born the Dental Protective Association. But who will deny that all who joined supposed that the Tooth Crown Company was to be fought in the hope of setting up a principle? . . . Has this hope been realized? Has any effort been made to erect the principle which the whole dental world believes to be just? . . . The fight has been conducted solely on one line. The patents have been fought separately, and one after another declared invalid, because priority of invention was shown. . . . Is it presumable that these men of commerce do not by this time understand the futility of endeavoring to sustain flimsy patents on antiquated methods? Is it not more likely that they will now endeavor to enforce recent and good patents? *Patents which the priority racket will be powerless to invalidate?*"—p. 222, 1898.

"It has cost the dental profession all the money that the Dental Protective Association has spent to prove a very few of them (process patents) invalid.

"But it can not be claimed that every process patent of the kind which we wish to see interdicted *has been or will be fraudulently obtained*, and the Dental Protective Association would be powerless to protect its members or the profession at large from the impositions of such patent holders."—p. 225, 1898.

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The Present Crisis.

Thus it becomes apparent that I have opposed process patents of a certain class, and that I also have opposed the expenditure of professional funds in efforts merely to prove particular patents invalid, on the ground of lack of invention, or priority of invention. Also that I long ago prophesied that some day the dental profession would find itself obliged to submit to some process patent which they would be unable to invalidate. The important questions now are: First, Is the Taggart process patent similar to those against which we have always been opposed? And second, Is it one that may be defeated by the same old methods as were employed by the Protective Association?

To the first I can not give a categorical "yes" or "no" for answer, the proposition being quite involved. To the latter we have a significant reply to my prophecy in that I am informed that Dr. Crouse, in declining to aid Dr. Boynton, declared that the Dental Protective Association was never formed to fight *valid* patents.

Taggart's Process Patent.

From the quotations which I have made it will be seen that at all times in the past I have had but one consistent notion of the sort of process patent that should not be granted. The Rubber Company, the Tooth Crown Company, and others cited, were all in one class. The "inventors" offered nothing for sale that was tangible. Their "processes" involved the use only of knowledge and skill coupled with the utilization of such mechanical instruments or appliances as could be purchased *legally* in the open market, and from others than themselves. These people had no possible means of obtaining revenue from their patents except by the sale of licenses, or by the exaction of royalties.

Does the Taggart process patent come within this description? It does not. It is quite essentially different. Indeed, I must declare that I never had known of nor thought of such a patent. As far as my study of the matter had led, the facts seem to be as follows: Taggart invented a casting machine, and has secured patent on the same. To this apparently no one takes exception. An integral part of this machine is a flask of definite form. Secondly, in accordance with a well established procedure in patent law, his patent application was divided, and a patent on the process itself was asked and allowed. A close scrutiny of this process



patent discloses the fact that it apparently can not be conducted without using some appliance which may be claimed to be an infringement of Taggart's machine patent, unless Taggart's own devices be used. And it is one sort of infringement to make use of a machine, or any part, which is an infringement of a machine, or part, protected by a patent.

Thus it seems that, unlike the Vulcanite and Crown Company patents, Taggart does have something for sale, and his process is one which requires the use of certain devices, which he has protected by patents, to which the dental profession as a whole takes no exception. The infringement complained of, therefore, is not merely that a patented process has been used, but also that in doing so the infringer is lending aid to a business competitor who is manufacturing a machine said to be an infringement of the Taggart patents.

Now, whether this contention be true or false, whether other machines on the market infringe Taggart's, or not, or whether the process of making a cast inlay is one that may be conducted without infringing Taggart's rights, are all matters which I can not decide, and which I do not feel called upon even to discuss at this time. My purpose here is merely to advise our readers of the true status. If any man believes that the Taggart patents can not be maintained in the courts, it is his legal privilege to combine with others in supplying funds with which to make the legal test. In doing so, of course, he renders himself liable to punishment, in some sort, in case the patents are declared to be valid.

At this point it will be opportune to give the quotation from Dr. Taggart's attorneys, which sheds a light upon the question not afforded to the profession in the circulars which have been mailed from Washington. The following is an extract from a letter written to me by a member of the legal firm managing Dr. Taggart's end of the case, and is therefore official:

**Dr. Taggart Not
Attacking Dentists.** "There is only one court in the United States from which a patent case can be taken as a matter of right to the Supreme Court of the United States, and that is, the Supreme Court of the District of Columbia. Desiring, therefore, to sue in the District of Columbia, it became necessary to find an infringer there, and the only infringer we could find was a dentist. The suit was not in fact aimed at the dentist, but at the maker. . . . The suit is for infringement committed by reason of the use of a machine manufactured by a well-known maker of dental instruments, and in all commercial ethics,

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the suit ought to be defended, not by the individual dentist, but by the maker of the machine. When we brought suit it never entered our heads that the maker of the machine would not come in and pay the expenses himself. Every commercial manufacturer makes it a practice to stand behind his purchasers, and we supposed when we brought suit that the individual dentist would be but a figurehead defended by the maker. This is a matter which ought to be defended by the maker of the machine, and if the dentists of this country are going to chip in and stand the burden, which the manufacturer in all ethics and good conscience ought to bear, they are merely being made catspaws of."

"We will call your attention to another fact which probably has not been mentioned to the profession. In our suit against Dr. Boynton we did not pray for damages, but merely asked that he be compelled to stop using the process. We have no intention of collecting damages from him in this procedure, and have asked for no damages. This fact can be verified by reference to the pleadings on file in court."

I am printing the above extracts because a very prominent dentist, to whom I showed this letter, made the following comment: "Why, I contributed to the Boynton fund, but this puts the matter in a new light. You certainly ought to publish that for the information of the profession."

The last quotation from the lawyer's letter is quite curious, when considered in connection with the latest circular from Washington, the first paragraph of which tells us that Dr. Taggart's bill of complaint sets forth that "Dr. Taggart was entitled to receive the 'gains profits and benefits' which had accrued to Dr. Boynton from the use of this process" which very cautiously worded statement leaves the inference that some attempt is to be made to obtain money damages. I am not able to decide which view is correct, not having read the "complaint." Our readers may choose for themselves between the two.

The Ethical and the Legal Aspects.

Let us now for a moment consider the ethical aspect of this matter, as co-related with the legal. The dental profession has almost unanimously evinced its opposition to process patents. But as we have partly shown (a full discussion would require too much space) this Taggart process, while having many of the objectionable possibilities of other process patents, is nevertheless inherently different. For further example, the Crown Company had *no way of realizing revenue except by royalty or license, and had nothing to sell*, whereas the Taggart concern has something to sell, and *having sold its machine can not collect royalty or*

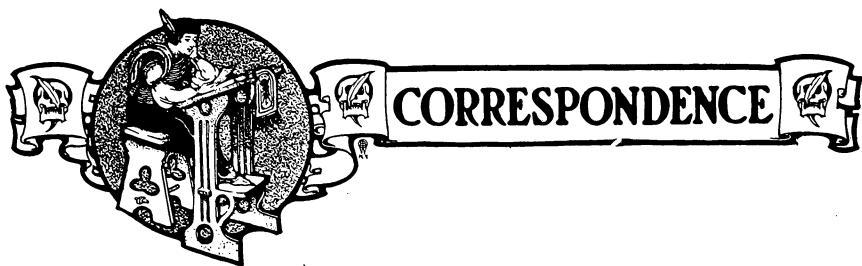


license fee. Nevertheless, this process patent, if valid, would certainly place within Dr. Taggart's means the right to issue licenses or to enjoin certain ones from using the methods at all. This is one contingency to be considered by those who decide to combine to fight his patents, because the Washington committee may be led astray by an over-confident attorney, and the Taggart patent may be proven valid after all.

Let us suppose for a moment that it is valid. What are the men in our profession doing? A great many have said that "it is unethical for Taggart to take a patent at all." That is a question which could be debated from many angles; but suppose we grant that also. Because Taggart has been unethical enough to take out a patent, is it ethical conduct to use his invention without his consent? Is not the dental profession just a little arrogant and selfish on this proposition? Because we are dentists, and find it inconvenient to obey the patent laws, are we legally or even ethically entitled to break them? Of course it is very nice to be able to soothe our consciences by declaring, "Oh, pshaw! That patent will never stand! No patent is valid, anyway, till tested in a suit." The only trouble is that this is not true. All patents are valid till invalidated in suit, and if the suit be decided in favor of the patentee, all infringers are liable. This conjures up a comical possibility. Just suppose that the Taggart claims are sustained, will those ethical gentlemen who are infringing his patents because it was "unethical for him to take out a process patent," immediately make reparation to Taggart for their infringement, which was both illegal and unethical?

In conclusion, I would point out that my own endeavors have been to render the dental process patent itself illegal and that in this effort all the assistance that was given by the dental profession was the contribution of a little money. In Washington, the present storm center, I first met cold opposition, then, after personal debate with them a simple resolution of indorsement, but no active help, with the notable exception of Dr. Emory A. Bryant, who did give me very great assistance, and with that assistance I succeeded in having a committee of Congress report our bill favorably, in spite of the energetic hostility of the Commissioner of Patents. The bill, however, died in that Congress, and it was not possible for two men alone to longer fight the battle of an uninterested profession.

R. OTTOLENGUI.



The Problem of Reorganizing the National Dental Association.

MY DEAR DOCTOR:

Referring to our correspondence relative to the reorganization of the National Dental Association and the proposed new constitution, I should say that the most careful attention should be given: first, to the present conditions in the National association; second, to the rules governing membership; and third, to the provision for the establishment of a Journal. Anyone who is cognizant of the work of the American Medical Association, or of the Illinois State Dental Society, needs no argument to persuade him that the general plan proposed is the proper one; however, we should remember that the mere adoption of a new constitution will not accomplish the reorganization desired and give us a truly National association. We must consider the National Dental Association as it stands to-day, the place which it occupies, the feeling among the dentists of the country toward it, and the possibilities of accomplishing something after the new constitution is adopted. There undoubtedly exists an apathy toward this organization which it will not be easy to overcome. To my mind, the most careful consideration should be given to the establishment of a different feeling between the National and the various State organizations, and through the latter to their members. There should be a national committee, as proposed in a resolution which the Illinois State Dental Society sent to the National Dental Association in 1907, to seriously undertake the work of reorganizing State societies, and, as this work progresses, the final culmination of it in a great National body should be constantly kept in view. It seems to be the general opinion that there will be no material progress in the reorganization of the National association so long as the men who have controlled its affairs for the past ten years continue in office. Please understand that I have nothing to say in criticism of the work of these men; on the contrary, I believe that the meetings of the National during the past five years have been the best in



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its history. Most of our people believe President Roosevelt did right in refusing to run again, and most dentists seem to think that there are enough good men in the profession to make a constant shifting of those in control of the affairs of the National association desirable. At any rate, that feeling has been expressed so often that it appears to me to deserve serious consideration. It has been an unwritten law in the Illinois society that a man who has been a member of our executive council for one term (three years) shall not be eligible for reelection until a three-year interval has elapsed. Some of the recently reorganized State societies have incorporated such a rule in their constitutions, and I think it might be well to so modify Article X, Section 2, of the proposed constitution of the National.

I should like to see a decided change in the rules on membership. I have always felt that the American Medical Association made its only great mistake in the adoption of its present rules, in that it does not *require* all of the members of the various State organizations to be members of the American Medical Association. The State Medical Society requires all members of its component organizations to be members of the State society, but it is optional with each member whether or not he joins the American Medical Association. Naturally many members of the State societies do not join the American Medical Association, but I believe practically all would have joined if the rules provided that membership in the local society necessarily carried with it membership in *both* the State and National organizations. The National Dental Association should not make the same mistake. Its rules should provide: first, that its membership shall consist of the members (all of them) of the constituent associations (State societies). Second, that State and Territorial associations shall consist of component or local societies, and that the membership of such State associations shall consist of the members (all of them) of these component or local societies. In other words, every member of every local or county society must also be a member of his State society and of the National association; his election to membership in the local society should carry with it membership in the State and National, and he should pay dues to the local secretary covering all three.

The local secretary should retain the portion of the dues belonging to the local society and forward the remainder to the State secretary who, in turn, should retain the portion belonging to the State society and remit the balance to the secretary of the National association. Thus the various local secretaries would remit for all local members to the State secretary, and the various State secretaries would remit for all State members to the National secretary. The National need fix only the amount of dues of the



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National association, allowing each State society to decide upon and add its dues to the amount, and each local society would, in turn, decide upon its local dues, which would be added to the State and National, the whole making up the amount to be paid by each member of that particular local society. For example, if the National keeps its dues as now, \$5.00, and the dues of a State society, Illinois, for example, are \$3.00, and of a particular local society in Illinois, \$2.00, then each of the members of that particular local society would pay their secretary \$10.00; he would retain \$2.00 per member for the local treasury and forward \$8.00 per member to the State secretary, who would retain \$3.00 per member and forward \$5.00 per member to the National secretary.

Under such a plan, the remittance by the State secretary to the National secretary would establish the membership of such members for the particular year; no one would be a member until his dues were paid; the by-laws should establish suspension on a certain date for non-payment. There would be no delinquent members. Such a plan should permit a suspended member to be reinstated on the payment of back dues, or he should be allowed to come in another year as a new member. There should be a provision for a life membership on payment of active membership dues for twenty-five *consecutive* years. This helps to keep members from lapsing, particularly after they have belonged for several years. We have followed this plan in Illinois for years, and it works splendidly.

If such a plan should be adopted, it might be wise to reduce the dues of the National to \$3.00 for a few years at least. The additional number of members would probably more than make up for the reduction.

In the proposed by-laws, Book III, Chapter ix, Section 2, provides for the publication of the Journal of the National Dental Association. I believe that this section should be laid on the table for at least a year, principally for the reason that it would be impossible to carry out its provisions in a way that would be a credit to the association. The establishment of a journal is in itself a very large undertaking, requiring in the beginning more money than the National association can hope to take in in several years. It could only be done with the backing of individual members, and would, at best, be uncertain. I appreciate fully the desirability of such a publication, but we must have first an association sufficiently large to support a journal.

If the reorganization work is undertaken by the National, it should at once begin the publication of an official bulletin. This would, I think, be a necessity. It can be published without a provision in the by-laws.

I believe I voice the sentiments of the members of the Illinois State Dental Society when I say that we are very much in favor of the re-

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organization of the National Dental Association on broad lines which will give each State representation in proportion to its membership. Illinois has been well organized long enough for our members to appreciate the advantages to be derived. We had over 1200 members in 1905, nearly 1500 in 1908, and hope to reach the 2000 mark within the next year. If other States had the same percentage of members as we have for 1908, and all belonged to the National association, we would have a total membership of about 20,000. When we think of the good work that has been accomplished by the present National with a few hundred members, it would seem that with the increased numbers probable as the result of a proper reorganization, many of the things for which the profession has striven since the organization of the first dental society would be within easy reach.

Very truly yours,

ARTHUR D. BLACK,
President Illinois State Dental Society.

MY DEAR DOCTOR:

Your letter of September 30th addressed to me at Oklahoma City, Okla., reached me on the 12th inst. While temporarily absent from the United States, I have not lost any interest in the welfare of the profession. I shall be happy indeed to see the National become the representative association, which the name implies, and will gladly do anything in my power to further the movement you write about. I am not one of those who have stood off and belittled the efforts of the National Association, but I do think that it far from fills the bill and that the first thing necessary for any considerable improvement is a revision of the constitution and by-laws, and as you suggest, patterned as much after the plan of organization of the American Medical Association as the contingencies of the case warrant.

In my address as president of the Oklahoma State Dental Association, delivered at Muskogee last June, among other things, I recommended that such a movement be started which would affiliate the county, district and State associations with the National, somewhat after the plan of the American Medical Association, and to help accomplish that and better organization in general, that the association require each member to subscribe for a national dental journal when one is published. By resolution unanimously passed, the Oklahoma Dental Association stands pledged to subscribe for a journal for each member, the subscription to be paid through the treasurer of the association annually. This recommendation about the journal precipitated



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a regular cyclone of criticism upon me from the editors and publishers of two journals, members of the N. D. A. also, but the resolution stands, however, and the association will stand by it.

Very truly and fraternally yours,

A. L. WHITE.

Morelia, Michoacan, Mexico.

DEAR DOCTOR:

Yours of the 30th concerning the future of the National Dental Association received.

I am not now a member, however; I allowed my membership to lapse some years ago, for the reason that it seemed to me I could get more good out of and accomplish more working with the organizations nearer home at considerably less expenditure of time and money.

To me the National Dental Association seemed only one more society, built on practically the same lines, working along in the same rut as all the rest, doing of course more or less good, as the societies necessarily do, but doing nothing adequate to entitle it to the pretentious title of "National." It is distinctly not national save in one feature, viz.: that it does not limit its membership to any one State or section. It represents nothing that is national in character, either in its work, its spirit or its membership.

Dr. Kirk, in an editorial in the October *Cosmos* entitled "Reorganization," has, to my mind, expressed the situation exactly.

Reorganization after some plan along the lines you suggest, therefore, commends itself to me, and I am sure you will find the sentiment in its favor, here in Illinois, practically unanimous.

Whether the constitution you offer will meet all the requirements, I am not prepared to say. A movement of such importance should receive most careful and serious consideration, but it is surely a move in the right direction.

The "Illinois plan," involving the systematizing of the work of its compound societies and uniting its members in one grand scheme of post-graduate study, is well worth looking into.

Were the profession of the whole country organized on some such lines, what could not be accomplished?

Yours truly,

C. B. ROHLAND.

Alton, Illinois.



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DEAR DOCTOR:

In reply to your circular letter regarding reorganization of the N. D. A., I must say that this move is necessary before we can hope for true progress. Not only the constitution and by-laws need revision, but the code of ethics also. I have not carefully studied the new constitution and by-laws published in *ITEMS OF INTEREST*, but the first reading looks rather lengthy and complicated. One addition I think necessary to Section 2, Chapter 3, viz., provide for honorary members at home also. The Georgia State Dental Society confers the title of "Honorary Fellow" upon members who had been in good standing twenty-five consecutive years, and gives them life membership without the payment of dues. Pre-eminent service at home—anywhere—should be honored by our national body.

I could not attend the Boston meeting, and I am glad of this privilege of expressing my approval of the plan to reorganize along the lines proposed.

Macon, Ga.

Fraternally,

A. M. JACKSON.

DEAR DOCTOR:

Your communication received, also the *ITEMS OF INTEREST* containing your proposed change in the constitution of the National Dental Association. I have gone over the changes very carefully, and I want to give my hearty endorsement to same. I think it a step in the right direction.

A move of this kind should be endorsed by every dentist who has the interest of the profession at heart. If at any time I can be of any assistance in this work, kindly call on me.

Yours to command,

L. B. McLAURIN,

(Recent President Mississippi State
Dental Society.)

Natchez, Miss.

MY DEAR DOCTOR:

In response to your request for opinions about the reorganization of the National Dental Association, I beg to say that it seems incomprehensible to me how anyone can question the urgent necessity thereof. This organization instead of becoming more representative



ITEMS OF INTEREST

each year has become less so. The lines recommended by you, following the plan of the American Medical Association, are beyond question what is needed in this direction. The main advantage to be gained in following out a plan of this nature would be that the House of Delegates to whom would be entrusted the entire business matters of the association would be a real representative body. They would not be elected by the association, but each delegate would have to be elected by his own State dental society. He would be held responsible for his actions by the State society which placed him in this position and would be removable at the will of his own State society whenever they felt that their interests were not best served by his presence in this body.

To realize what an organization based in these principles means, it is only necessary to attend the sessions of the House of Delegates of the American Medical Association. They are open to the public and at their next meeting at Atlantic City in June, dentists who have any question about the superiority of this method of conducting affairs, would do well to visit the same and compare the different methods of running an organization. They will find that the sole object of this body is working for everything that tends to professional advancement and that there is an absolute lack of petty politics and personal aims. They will find an organization complete in every detail and business conducted in a manner that is a great contrast to what we have been accustomed to.

Very respectfully yours,

M. L. RHEIN.

38 East 61st street, New York.

MY DEAR DOCTOR:

Replying to your communication of the 30th ult., relative to the reorganization of the National Dental Association, I beg to say that I approve most heartily of the plan suggested by you at the last annual meeting of the association, held in Boston, and which carries out the plan which governs the American Medical Association. I believe most thoroughly that the time is now at hand when the National Dental Association should get out of the rut which it is in at present, and adopt some method by which we can call ourselves a National Dental Association, and have a membership of thousands, where we have at present only hundreds.

With kindest regards, I remain,

Fraternally yours,

R. HAMILL D. SWING.

Philadelphia, Pa.



ITEMS OF INTEREST

DEAR DOCTOR:

I am glad to see you take hold of this N. D. A. constitution and bring order out of chaos. I believe the time has come when a change must be made to save us from utter ruin. I am with you.

The injection of politics has been the ruin of our association; the wire-pulling begins the first day and lasts through the whole meeting. Those that attend the meeting in order to get some good out of it can not, for the politicians and ward heelers will not keep still. As I see it the new constitution will eliminate this feature and let those that want to hear and see the theoretical and practical side of what others are doing toward the elevating of our great profession.

I do not know that what I want to suggest should come in here or not, but I am going to mention it. I have found in all the meetings that I have attended that there is a lack of interest shown to an important part and that is the scientific part of the meeting, from the fact that the clinics attract the attention of most of the members, as you have no doubt noticed there would not be more than a handful to listen to some of the most scientific papers written by men that have devoted years to this part of the profession; but go to the clinic room and it will be packed and all excitement. I am not decrying the practical part of our profession, but I believe they should go hand in hand (theory and practice). If it could be fixed so that our clinics could be given the first or last day, and not allow the clinic room to be opened during the reading and discussion of papers, I think it would be a good thing. It is much like a big circus—three rings going at one time, and you can not see and hear all.

I am glad to add my little mite to a good cause, and I say I am with you and if I can be of any assistance, call on me.

Yours truly,

WM. C. KING.

(Professor in University of Tennessee.)

DEAR DOCTOR:

In reply to yours in reference to the new constitution for the N. D. A., as published in the September ITEMS OF INTEREST, I approve of it. With some minor points in it slightly modified, I think it would be perfect.

Yours fraternally,

W. T. MARTIN.

Yazoo City, Miss.



ITEMS OF INTEREST

DEAR DOCTOR:

I am heartily in favor of the change of the constitution, and I am also heartily in favor of building all our dental matters along similar lines with that of medical men and their associations; in fact, I am a strong advocate of joining hands with the medical men and making our association a part and parcel of the American Medical Association, holding our identity as a Dental Department.

This would, at one leap, put us higher in the esteem of professional men and put us in better financial condition than we can hope to be in twenty-five years. It would also be a great help toward our interests in Congress and State legislation.

Yours very sincerely,

W. E. GRANT.

(Dean Louisville College of Dentistry.)

Louisville, Ky.

Splints in Pyorrhea.

Editor ITEMS OF INTEREST.

Dear Sir—My allusion to dental splints at Asbury Park seems to have been misunderstood by those present.

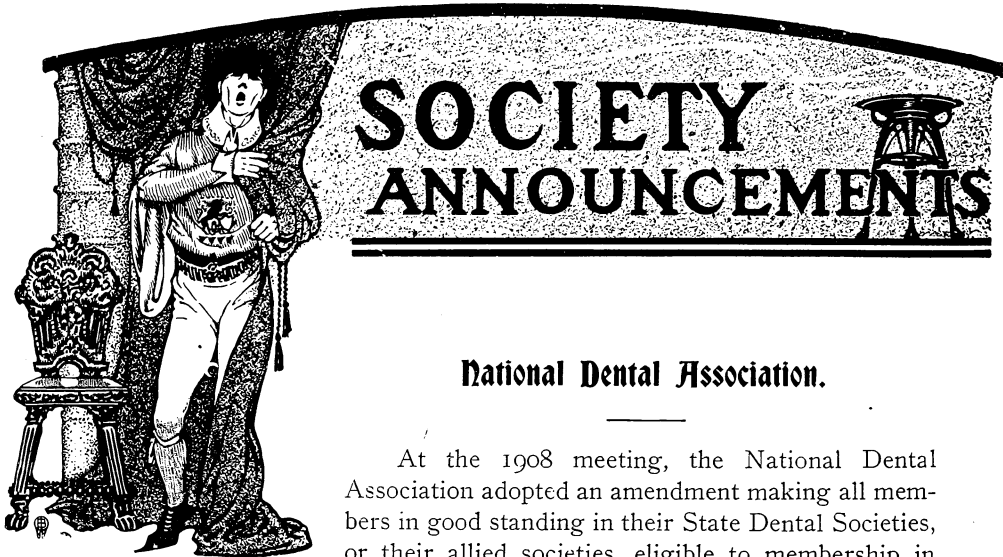
What I desired to impress upon the audience was the fact, not that dental splints were new, or the kind I use superior to others, but how strange it is that more dentists do not insert them, and to emphasize this fact I stated that I had never seen anyone in my office with one, when in many instances there should have been a splint used years before. This neglect is more apparent to me, as having been in Kansas City, Mo., only a comparatively short time, my patients are all new ones, consequently I have seen more than the usual number of other dentists' patients, not alone Kansas City dentists, but from all parts of the country, as this city, with its marvelous growth, has new inhabitants from all sections.

As regarding the kind I use being, in the opinion of some, antiquated, I will state that I have tried every one of the fifty-seven varieties, and find as a rule the "kind mother made" the best, even if antiquated.

Yours,

Kansas City, Mo.

J. P. Root.



National Dental Association.

At the 1908 meeting, the National Dental Association adopted an amendment making all members in good standing in their State Dental Societies, or their allied societies, eligible to membership in this association, by presenting to the proper authorities at the regular meeting a certificate signed by the president and secretary of any such society.

Those desiring to take advantage of their privilege under said amendment should act promptly, as the National Association meets early next year, the last Tuesday of March, 1909, at Birmingham, Ala.

Blanks can be secured from the secretaries of the various State dental societies, or the undersigned.

H. C. BROWN, Corresponding Secretary,
185 East State Street, Columbus, Ohio.

South Dakota State Board of Dental Examiners.

The next meeting of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, South Dakota, January 12, 1909, beginning at 1.30 sharp, and continue three days. All candidates must bring appliances and materials necessary to do all kinds of filling, crown and bridge work, and articulate a full upper and lower set of teeth. A recent ruling of the Board makes it compulsory with all candidates to have their examination fee of \$10.00 in the hands of the secretary before January 5th, and positively no candidates will be received who have not thus complied with said rule.

G. W. COLLINS, Secretary.



California State Board of Dental Examiners.

The next examination by the Board of Dental Examiners for the purpose of examining applicants to practice dentistry in the State of California, will be held in San Francisco beginning on December 10, 1908.

Yours very truly,
C. A. HERRICK, Secretary.

Rhode Island Board of Registration in Dentistry.

The Rhode Island Board of Registration in Dentistry will meet for the examination of candidates at the State House, Providence, R. I., Tuesday, Wednesday and Thursday, December 29, 30 and 31, 1908. Application blanks and particulars may be obtained from

H. L. GRANT, Secretary.
1025 Banigan Building, 10 Weybosset Street, Providence, R. I.

Indiana State Board of Dental Examiners.

The next regular meeting of the Indiana State Board of Dental Examiners will be held in the State House at Indianapolis beginning Monday, January 11th, and continuing four days.

All applicants for registration in the State will be examined at this meeting. For further information, blanks, etc., apply to the Secretary,

F. R. HENSHAW.

Middletown, Ind.

Pennsylvania State Board of Dental Examiners.

Examinations will be conducted by the Board of Dental Examiners of Pennsylvania simultaneously in Philadelphia and Pittsburgh, December 9th to 12th, 1908.

For application papers or any information, address

DR. NATHAN C. SCHAEFFER,
Secretary, Dental Council.

Harrisburg, Pa.

DEC 4 1908

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Vol. XXX. No. 12
December
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R. Ottolengui, M.D.S., LL.D.
Editor
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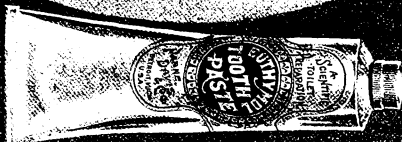
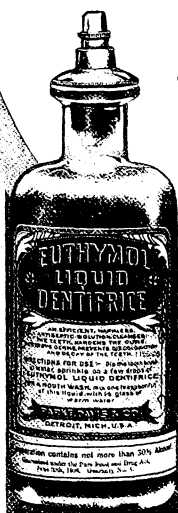
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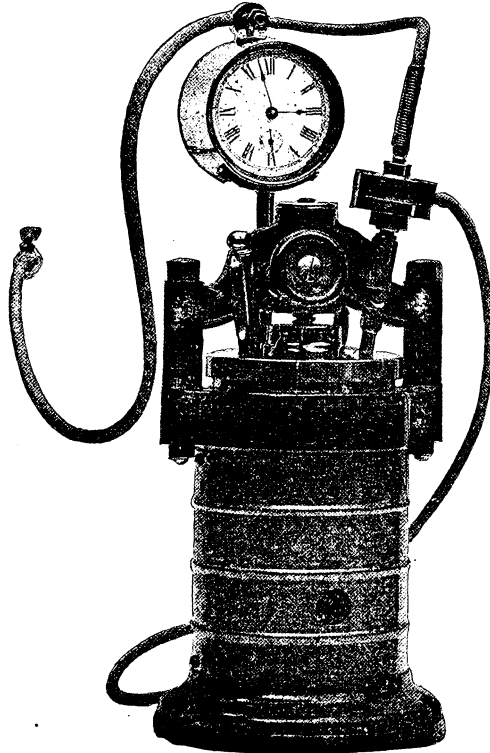
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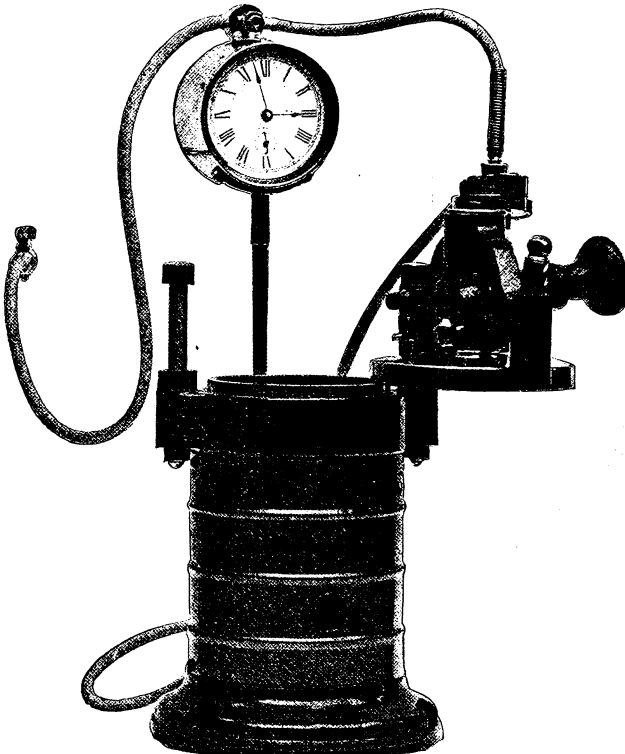
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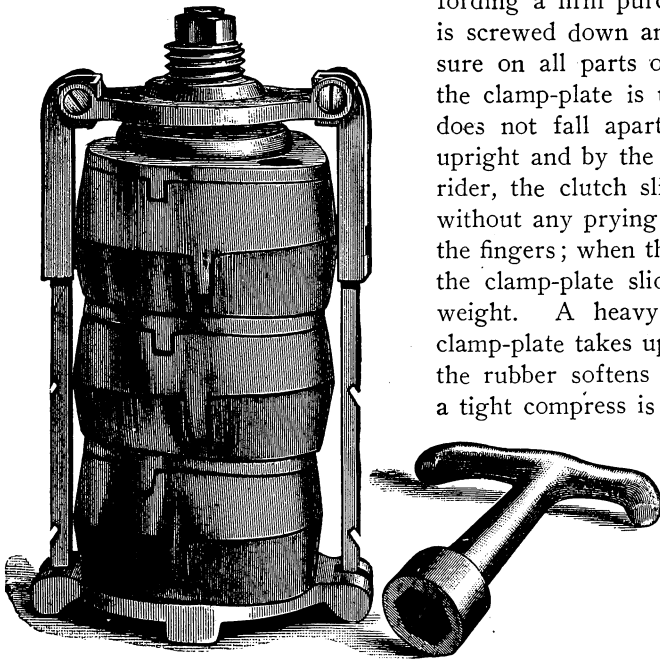
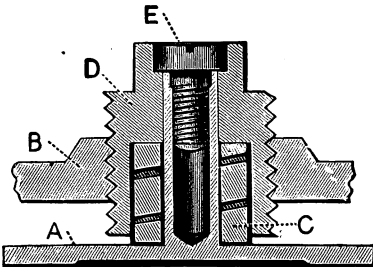
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Bracket for holding Timing Attachment, each	2.00
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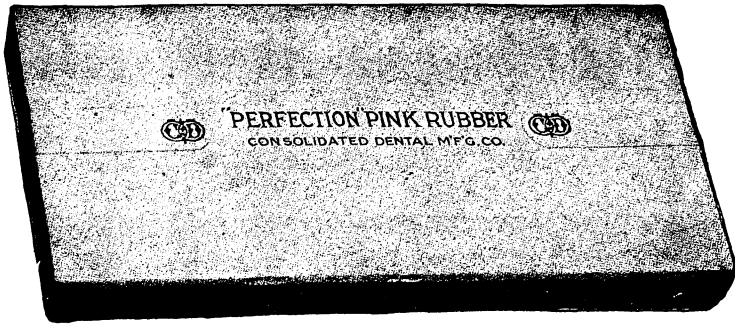
the cases and flasks shrink to the improbable extent of one-quarter of an inch. The clamp-plate, riders and spring are made of tempered steel. All

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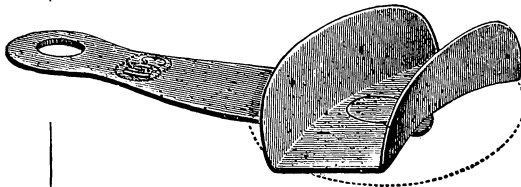
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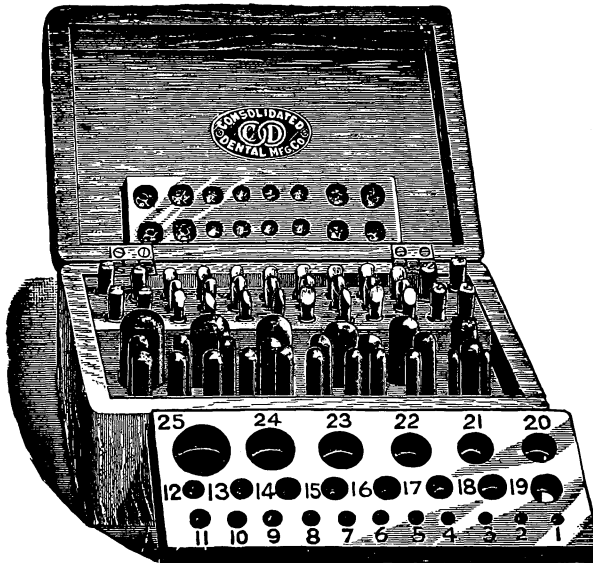
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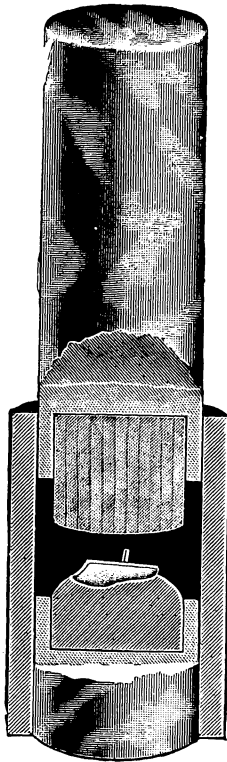
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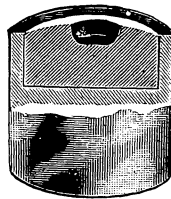
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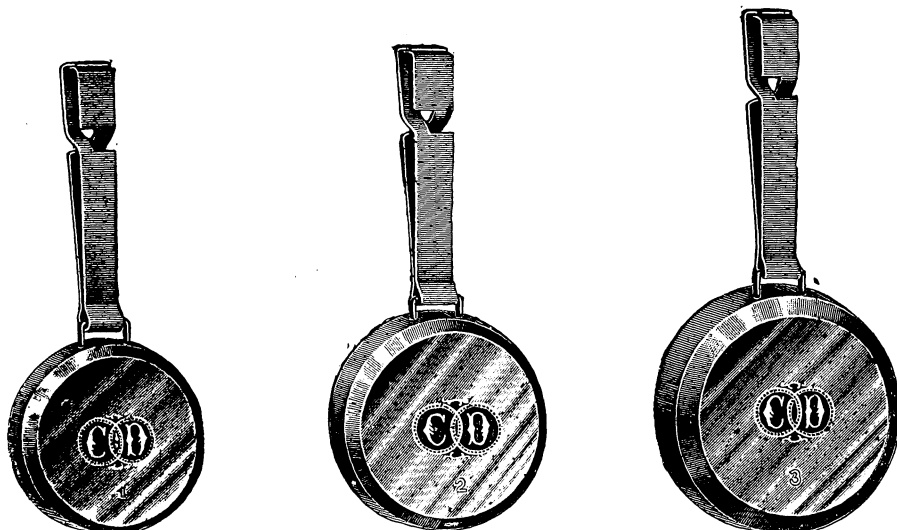
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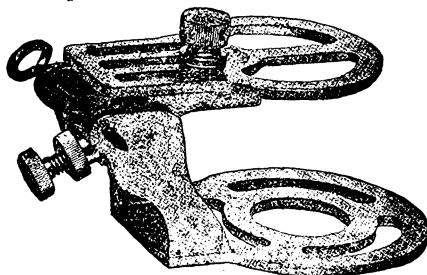
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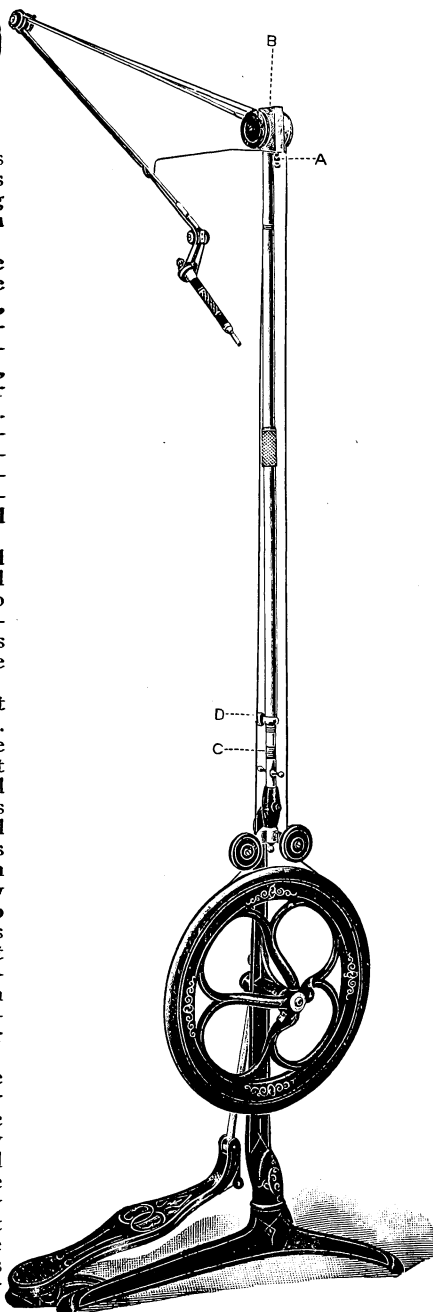
The C. D. M. Co. All-Cord Engine embodies numerous improvements on other makes of this style. The design has been simplified, adding largely to its convenience and effectiveness in practical operation.

The power from the drive-wheel direct to the handpiece spindle is carried by means of the cord, without any interference or obstruction, regardless of the position of the arms, wrist-joint, or handpiece. The absence of intermediate cables, shafts, or other driving mechanism, permits the transmission of all the live power of the engine to the handpiece spindle alone. It thus supplies the operator with a large volume of power in the handpiece. Jumping, jamming, or stoppage of the bur, in cases of difficult and heavy cutting and grinding, is entirely overcome with the C. D. M. All-Cord Engine.

The suppleness of the elbows, arms, and joints is surprising. Free action is found at all joints. There is no feeling of stiffness, no matter how abrupt or short a turn of the handpiece the operator is obliged to make. In this respect it has all the suppleness of a cable engine.

The upper arm can be easily adjusted at "A" to remain at any elevation when at rest. By adjusting it properly, the hand of the operator is relieved of unnecessary weight. It is pivoted at "B," and when at rest a small pendulum spring in the interior of "B" keeps it at the elevation to which it is adjusted and checks swinging up out of reach. The arm has easy action downward and laterally. This arm is also adjustable so as to gently swing away when the operator is finished. It can be set to swing in either direction and as far away as desired. It is actuated by a small spring at "C." The upper section of the spindle telescopes over the lower, and is held in position by the thumbscrew "D." By raising or lowering the upper section the belt is tightened or slackened to obtain proper tension.

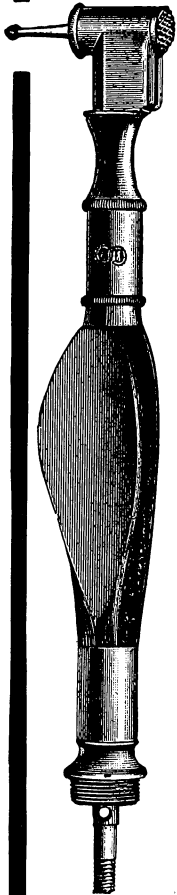
The material for the respective parts is the best of its kind, and the most suitable for their functions and uses. We use the most durable material, and while it is somewhat more costly than found in other makes, we know it will last longer and give better service. This is the most economical policy, and assures reliability and satisfaction; likewise, we employ the finest workmanship, it being our policy to produce only first-class goods, and we have found this to be the most excellent advertisement for our large line of dental specialties.



Price, Complete with Wrist-Joint and Regular Handpiece	-	-	-	-	-	\$50.00
Regular Handpiece, Wrist Attachment and Slip-Joint	-	-	-	-	-	55.00
All-cord Handpiece	-	-	-	-	-	64.00

CONSOLIDATED RIGHT-ANGLES

Style A

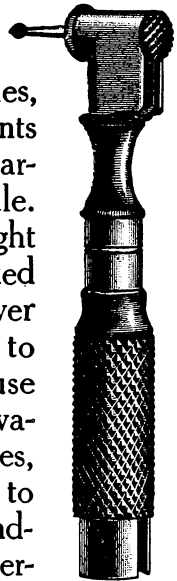


THE sliding bur catch on these handpieces is the decided improvement over all other styles, which has made these instruments so successful and popular during the comparatively short time they have been on sale. The slide is pushed up or down by slight finger pressure. The bur is thus easily locked or released by the most simple operation ever used in a handpiece. This is vastly superior to the other crude locking catches which cause the breaking of finger-nails and other aggravations and delays at critical moments. Besides, this is the most effective and positive lock to hold the bur ever used in a Right-Angle Handpiece. It insures immunity from the exasperating troubles which dentists encounter so frequently with insecure bur-locking devices in Right-Angle Handpieces.

¶ In our handpieces the bur does not wobble and it cannot fall out; it is inserted in the head, the slide pushed up, and immediately the handpiece is ready for use.

¶ The head of the Right-Angle Attachment is built exactly the same way, and both are examples of the high grade mechanical construction and skillful workmanship by which all our engine instruments have gained much use and favor.

Style B



PRICES

Style A—Right-Angle Handpiece, with collar attached for Slip-Joint.....	\$6.00
—Right-Angle Handpiece, without collar for Slip-Joint	5.00
—Collar	1.00
Style B—Right-Angle Attachment to fit over Consolidated or No. 7 Handpieces	4.00

Set of Directions with each Attachment.

CONSOLIDATED HANDPIECE

THE striking and long troublesome defects which have heretofore pronounced the shortcomings of the Universal Handpiece, viz., the sectional and loose-jointed spindle, the insecure bur chuck and the exposed oil-covered and dirt-collecting section of the spindle coming in contact with the operator's hand, have been entirely eliminated in this new model.

In the Consolidated Model the entire length of the spindle is in one piece, forming a continuous rigid shaft with broad end-bearings. The effect is that of a long bearing in which there is no vibration and no lateral wobbling of the bur.

A very important advantage is the provision which automatically takes up the wear, both that of the bur shanks and in the handpiece parts. Even though the wear is infinitesimal or the opposite variation as much as one-sixty-fourth of an inch, the chuck adjusts itself automatically to take it up. The claim made for other handpieces is that they will take any shank of the standard size. The deficiency of this limited range is at once demonstrated not only by the variation in the gauges of bur shanks made by dental manufacturers, but by the wear always resulting from constant use.

By loosening a single screw, No. 7, the entire case can be removed and the running parts oiled through a single hole. The entire spindle is enclosed, no oil-covered parts are exposed and leakage of oil is prevented.

Watch-work best expresses the character of its construction. Noiseless light running and durability are guaranteed. It is the product of ingenious ideas and skilled mechanical workmanship; for practical use a more serviceable handpiece has not been devised.

CONSOLIDATED HANDPIECE ONE PIECE SPINDLE

No Oil Covered Sections Exposed. Automatic Locking Chuck for Shanks of Various Gauges.

OPERATION

The bur is locked in the handpiece by simply pushing the slide, No. 1, upward.

The operation involved is illustrated in the cross-section, figure 2. When the slide, No. 1, is pushed upward, the ratchet, No. 2, is pushed against the dog, No. 3, which acts as a lever. Its toe, No. 4, moves upward, transmitting the leverage directly against the chuck No. 5, which closes as it rises higher into the diminishing space between the converging walls of the nose. The intense pressure against the chuck clamps it on the bur shank which thus becomes a rigid projection of the spindle. The pressure is evenly distributed on all parts of the chuck. The standard size shank can be tightly locked when the ratchet, No. 2, is pushed up only one step. Shanks of smaller diameter are locked by advancing it further and it will be seen that the ample range provides for shanks of various diameters.

The case, No. 6, can be removed by loosening screw No. 7. To take up wear between the spindle and the case, turn screw No. 8, to bring the case closer to the shoulder, No. 9. The handpiece is oiled through a hole in the spindle directly under No. 7.

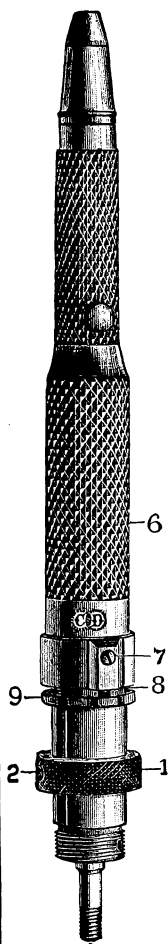


Fig. 1

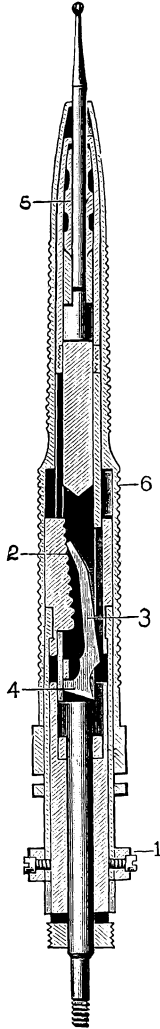
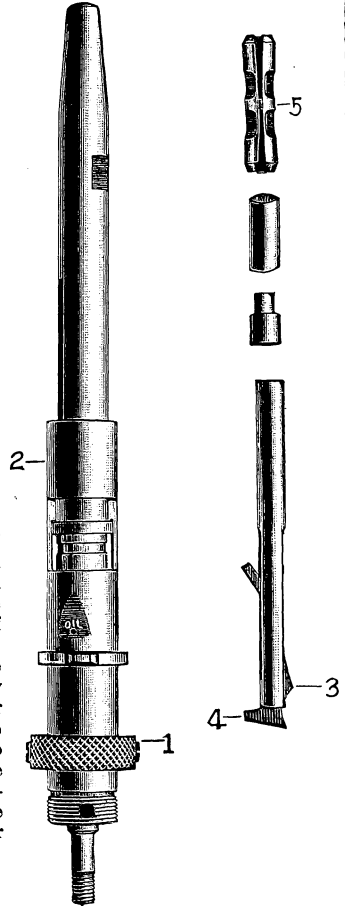


Fig. 2



PRICE \$7.00

FOR SALE AT ALL LEADING DENTAL DEPOTS

CONSOLIDATED  DENTAL MFG. CO.

NEW YORK

CONSOLIDATED SLIP-JOINT ATTACHMENT

**In brief, this Attachment is simple, effective
and substantial.**

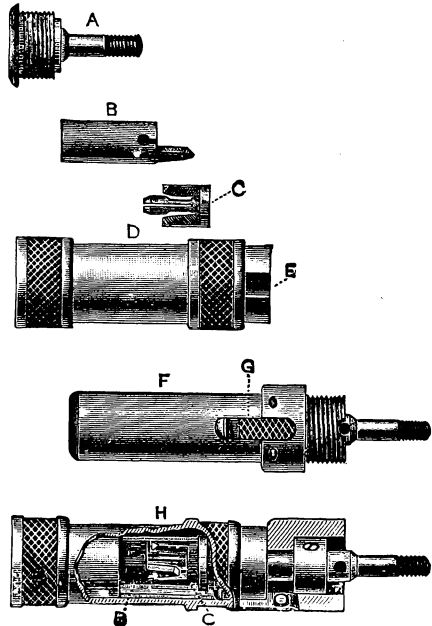
The simplicity of the Consolidated Slip-Joint will appeal to all users. It properly serves its primary purpose, viz. : to assist the operator and facilitate his work. It has no large projecting parts to encumber or interfere with the operator. A complicated attachment can not be consistently classed as a Slip-Joint.

To permit and facilitate rapid interchangeability without diverting the operator's attention from his work, the Consolidated Slip-Joint will be found much more convenient than other styles.

The illustrations show the relative position of each part, between the handpiece and duplex attachment, when assembled.

The method of assembling and operation is as follows :—

The dog B is screwed to the spindle of each handpiece (A) to be used. A collar, D, is screwed over it to the ferrule of each handpiece also. This comprises the proper equipment for each handpiece or mallet. The part F is attached to the duplex attachment. To connect the handpiece the latter is slipped over part F and held firmly by the spring latch G. The part C, which is part of the spindle in the interior of F, engages with the dog B and the split shank binds in the inner wall of the dog as shown in H. It thus becomes an auxiliary clamp and takes effect simultaneously when the handpiece is slipped on. We furnish 2 dogs and 2 collars when Slip-Joint is ordered, unless otherwise instructed.



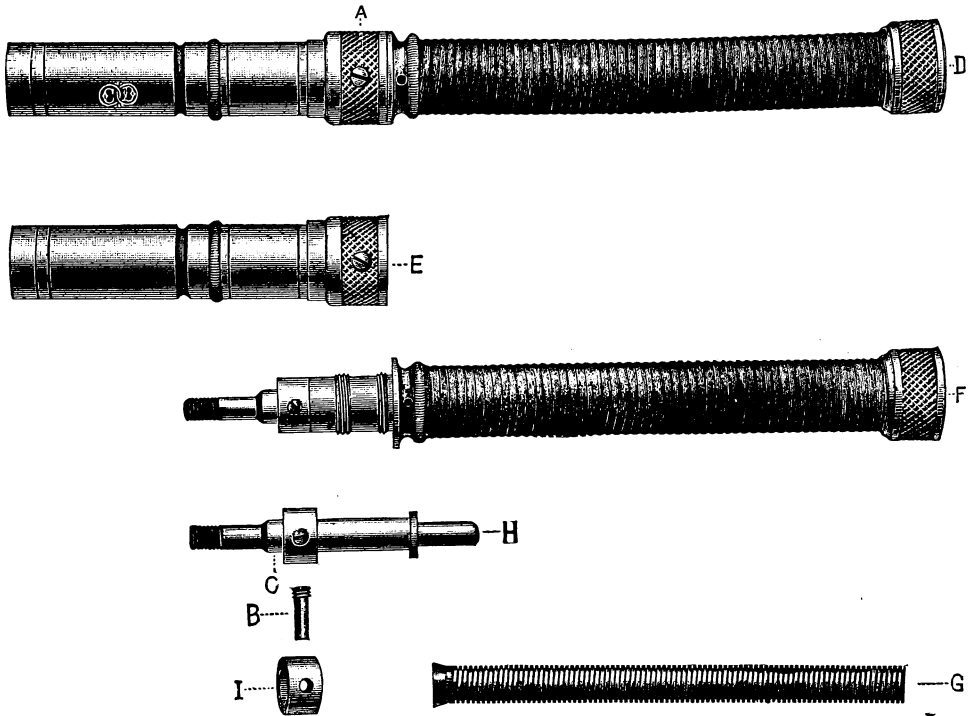
PRICES

Slip Joint	\$5.00
Slip Joint with Extra Collar and Dog	6.25
Spring Piece with Driving Attachment, Part F	3.75
Collar	1.00
Dog25

FOR SALE AT ALL LEADING DENTAL DEPOTS

**CONSOLIDATED  DENTAL MFG. CO.
NEW YORK**

Duplex Spring Connection



This wrist-joint, connecting the engine cable with the handpiece spindle, is essential for giving to the handpiece easy and wide range of action without retarding or interfering with the transmission of power from the engine. This connection can be doubled upon itself without reducing the speed of the cable or handpiece spindle.

The Duplex spring G is the connecting link which furnishes the added flexibility to the cable-driven handpiece, and upon which the utility of a cable-arm engine is largely dependent. It is encased in the leather covered flexible sheath F. The spring is forced on the stem H and then inserted into the sheath and held in position by the collar I-B.

The Duplex Spring possesses unusual torsional strength and regardless of twisting, flexing, or stretching, it does not loose its shape or properties.

PRICES.

Duplex Spring Connection complete.....	\$2.50
Duplex Spring with Brass End, each.....	.25

FOR SALE AT ALL LEADING DENTAL DEPOTS

CONSOLIDATED  DENTAL MFG. CO.
NEW YORK



Realization Burs

are not surpassed in any
single desirable bur quality

¶ Millions of them used by discriminating dentists have established the fact.

A trial proves it!

Save your handpiece too

The shanks of Realization Burs are true and do not rack the handpiece.

PRICE:

ONE DOLLAR PER DOZEN
TEN DOLLARS PER GROSS

Are you buying your burs right?

Get the sealed package.
For Sale at all leading Dental Depots

Consolidated  Dental Mfg. Co.

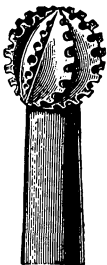
NEW YORK PHILADELPHIA CLEVELAND
BOSTON DETROIT CHICAGO



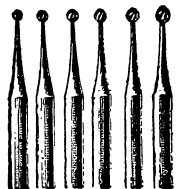


Realization

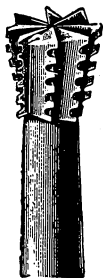
Cross-Cut Enamel Burs



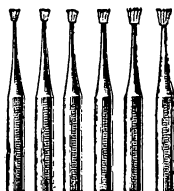
Round



502 503 504 505 506 507



Inverted Cone

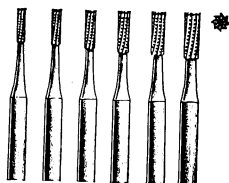


535 536 537 538 539 540

Enamel Fissure Burs



Square End Fissure



557 558 559 560 561 562

These burs are made entirely by machine. Their cutting edges are multiplied by the transverse serrations and every edge is sharp. Realization Cross-Cut Enamel and Enamel Fissure Burs are accurate, perfectly finished, and without rough edges. Quiet, smooth and effective cutting of enamel is insured. With so many points attacking the enamel at once, these burs are very powerful, and remove tooth structure more aggressively and quickly than any other form of bur. Cavities prepared with Realization Cross-Cut Enamel Burs have walls fissured ready for the reception of plastic fillings, which cling tenaciously to walls so prepared.

PRICES

	Dozen	Half Gross
Nos. 502 to 507 Round . . .	\$1.25	\$7.00
Nos. 535 to 540 Inverted Cone .	1.50	8.00
Nos. 557 to 562 Square End Fissure, .	1.50	8.00

**Get the Sealed
Package**

Consolidated  Dental Mfg. Co.

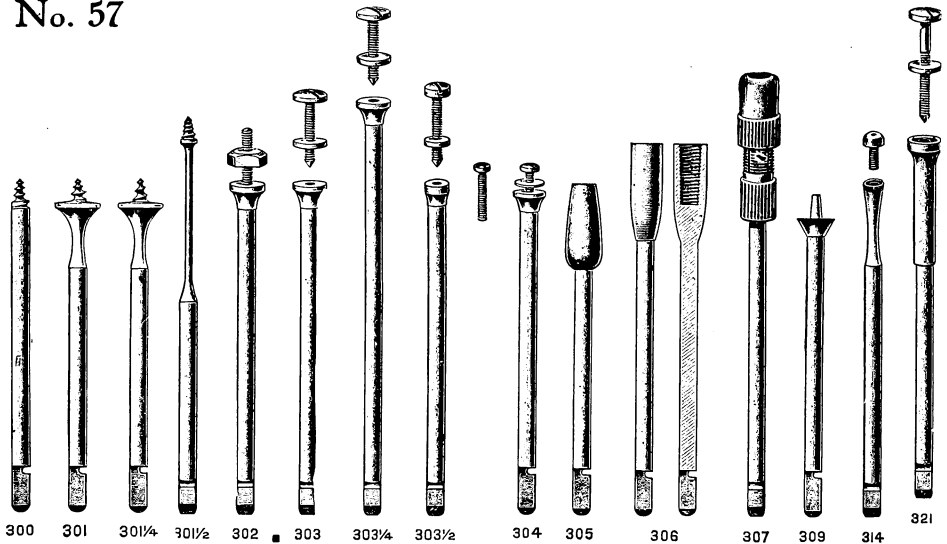
For Sale at all Leading
Dental Depots



Mandrels, Porte Polishers, Etc.

Made of Non-Corrosive Metal and Nickel-Plated

No. 57



- No. 300, Screw Mandrel, without shoulder.
 No. 301, Screw Mandrel, with shoulder.
 No. 301¼, Screw Mandrel, with shoulder.
 No. 301½, Long Stem Screw Mandrel, with shoulder.
 No. 302, Parting Nut Mandrel.
 No. 303, Dr. Huey's Screw-head Mandrel.
 No. 303¼, Screw-head Mandrel, extra long
 No. 303½, Screw-head Mandrel for small disks.
 No. 304, Disk Mandrel with two screws and washer.
 No. 305, Porte Polisher, with plain socket.
 No. 306, Porte Polisher, with screw socket.
 No. 307, Dr. Klump's Screw Clamp Porte Polisher.
 No. 309, Dr. Harris' Mandrel for mounting corundum and corundum disks.
 No. 314, For very small disks.
 No. 321, Same style as 303, but having an extra long pin and a reinforced shank. It is especially adapted for large polishing and grinding wheels.

Prices

No. 300, each	\$.07
Nos. 301, 301¼, 301½, 302, each.....	.15
No. 303, each15
No. 303¼, each.....	.15
No. 303½, each.....	.15
Nos. 304, 305, each.....	.20
Nos. 306, 307, each.....	.25
No. 309, each15
No. 314, each.....	.25
No. 321, each.....	.20

FOR SALE AT ALL LEADING DENTAL DEPOTS

CONSOLIDATED  DENTAL MFG. CO.

NEW YORK

No. 73

Paper and Cloth Disks for Polishing

Made in Sand Paper, Carborundum, Cuttlefish, Emery Paper, Garnet Paper and Crocus Paper



These disks are uniformly made of selected, high grade material and clean cut, with smooth shellacked backs. Charged on one side only. They are strong and durable and are made to resist disintegration by saliva or liquids. The grit is sharp and firmly set, and dentists will find their work easily accomplished. Sizes— $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$ inch. Grits—Fine, Medium, Coarse. $\frac{1}{4}$ inch size and medium grit is always sent unless otherwise specified.

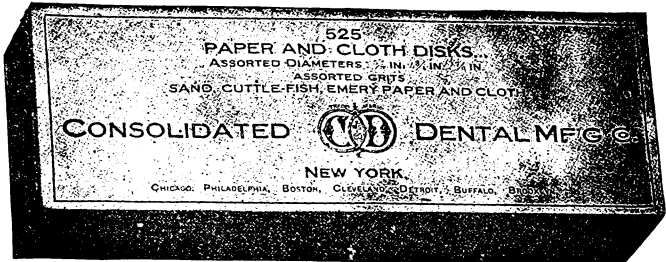
PRICES

Box of 100.....\$.10
12 boxes.....1.00

No. 74

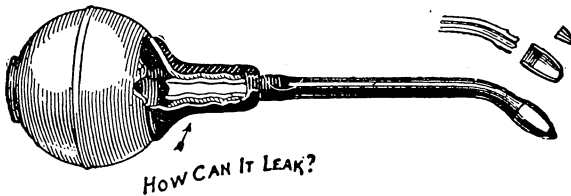
In boxes of 525 disks each. Sizes— $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ inch. Each box contains Sand Paper, Carborundum, Emery Paper, Cuttlefish, Garnet, Crocus Paper and Emery Cloth. Grits—Fine, Medium, Coarse, Extra Fine and Assorted. All neatly divided in six compartments.

Price, per box.....\$.50



THE IMPROVED Spooner Quick Filling Syringe

(Patent Applied For.)

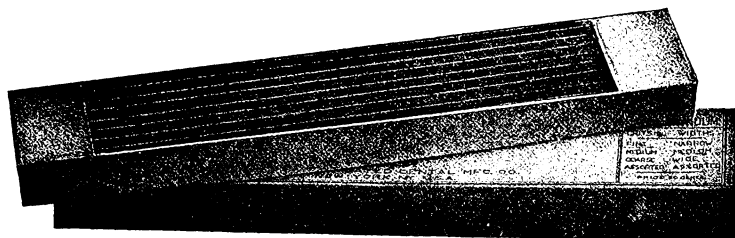


With the new style point and powerful Para bulb, this is the quickest of quick filling syringes. The point, with the exception of the patent tip, is made of hard rubber, obviating corrosion and so constructed to entirely prevent leakage. When filling, the tip permits of rapid inflow of water and in discharging, the stream is fine but forcible enough to dislodge all matter without flooding the mouth. For dental purposes this improved syringe is indestructible unless violently abused; the bulb is the only part to be eventually replaced.

Supplied with Right Angle or Straight Points

Price \$1.50

CRESCENT STRIPS.



THIN AND STRONG

A MOST desirable combination of quality in strips. In producing these strips our first consideration is the selection of material of the maximum strength. Crescent strips are made of linen and expertly charged with selected abrasives and polishing compound. They are cut with a clean, smooth edge and can be used in the narrowest of spaces between the teeth. They are absolutely odorless and remarkable in efficiency and durability.

Our boxes are made with covered ends extending three-quarters of an inch over the box. These projections keep the ends of the strips in the boxes, preventing crumbling, straggling and loss of the strips when sliding the box in or out of the cover.

No. 294A **Crescent Polishing Strips**

For putting a lustre on a filling after the finishing strips have been used. They have no cutting properties and can be used without danger of scratching or changing the contour of the surface produced by the finishing strip. We have incorporated in this strip a composition which produces a high polish. The "Crescent" quality is assurance of maximum strength. Put up in three widths—narrow, medium or wide, and in boxes of assorted widths.

Price per box, 50c.

Crescent Finishing Strips

CARBORUNDUM ... GARNET

Both Carborundum and Garnet strips are $6\frac{1}{2}$ inches long and are made in three grits—fine, medium and coarse, and three widths—narrow, medium and wide. We put them up in boxes of any of the above selections, or in assorted grits and widths.

PRICES

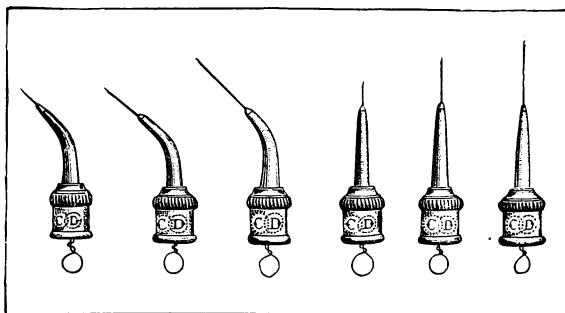
No. 294B—Carborundum, per box, \$0.50
No. 294C—Garnet . . . per box, \$0.50

FOR SALE AT ALL LEADING DENTAL DEPOTS

CONSOLIDATED  **DENTAL MFG. CO.**

CONSOLIDATED HYPODERMIC NEEDLES

NON-LEAKING



THESE points are made in the most careful manner of best French seamless tubing of special high carbon steel alloy which resists corrosion. The point is reinforced by the extension of the outer tubing as illustrated, preventing leakage, bending and looseness. The needle points are perfectly drawn and sharpened so as to enter the gum or flesh readily with little pain and without leaving a large or ragged wound. The special feature of these needles is in the high-tempered, seamless points, which guarantees against leakage, affords largest possible calibre in the finer sizes and maintains a sharp, keen edge.

Straight and curved.

Three gauges—25, 26 and 27.

Three lengths—short, medium and long, as illustrated.

No. 26 gauge is always sent unless other size is specified.

Put up in aluminum boxes of one dozen each.

PRICES

Straight, each . .	\$0.10	Curved, each . .	\$0.15
Straight, per dozen	1.00	Curved, per dozen .	1.50

AN UP-TO-DATE INSTRUMENT

Consolidated Crown Slitters

(PATENTED.)

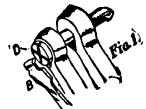
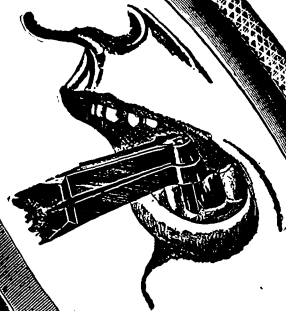


THESE forceps are entirely unique and superior to any other appliance on the market for removing gold crowns. The small knife blade point is inserted under the cervical edge and the plier rim is rested upon the occlusal end of the crown. Then by simply compressing the handles of the forceps the crown is easily slit lengthwise. In this way a crown or bridge anchorage can be readily and neatly removed and the slit crown replaced if wished, by soldering the slit edges of the crown after bringing them together. The great advantage of this slitter is the fact that by turning the knife, the front, side or rear of a crown may be slit with equal ease. All parts of the mouth can be reached with equal facility and without any danger of cutting the cheeks.

One of the reasons why the Consolidated Crown Slitters are so popular is because of their ingenious construction, which admits of slitting gold crowns at any point the operator may decide upon—front, side or rear.

The knife "A" is to be inserted under the cervical edge of the crown and the rim "C" rested upon the occlusal end of the crown. By lifting the spring "B" the knife may be turned in any position so as to cut any part of the crown or reach any tooth with equal facility. The slit "D" in the top of the knife piece prevents it from turning. The knife piece can be taken out or replaced by lifting the spring "B" and turning it on Fig. "F."

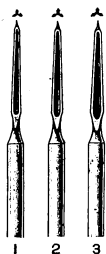
Price \$3.50; extra knives 50 cents each



FOR SALE AT ALL LEADING DENTAL DEPOTS

CONSOLIDATED  **DENTAL MFG. CO.**
NEW YORK

The Davis Crown Reamer



A pin fitting
a root
as snugly as
this is
stronger
and safer
than



one fitting
like this

THE Davis Crown Reamer enables you to fit the Davis Crown Pin as accurately as if the metal was poured into the root. The Reamer removes the minimum of tooth structure, and a root thus prepared corresponds exactly with the shape of the Davis Crown Pin, which fits into it perfectly its entire length. The Reamer and Pin are made for each other. For successful Crown Fitting use the Davis Crown Reamer.

*Made in three sizes to correspond
with the three sizes of Davis
Crown Pins.*

PRICES		
Each	\$.60
Per set of 3	1.75

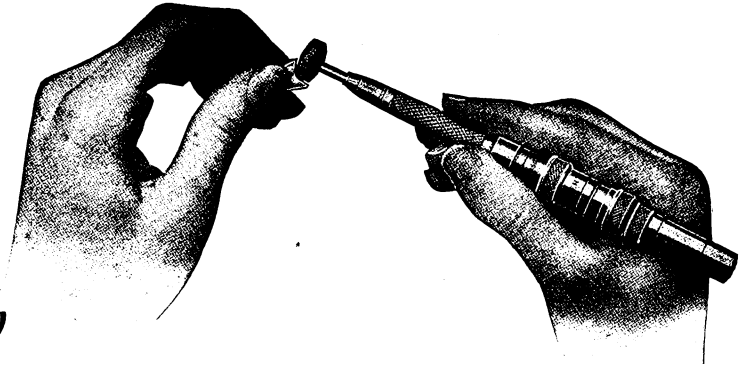
Consolidated  Dental Mfg. Co.
NEW YORK



With this
wedge - like
fit



the whole
root
must bear
the shock
of any
strain



Exact Grinding Makes Accurate Fitting Easy and accurate fitting is scientific dentistry.

By using the Davis Crown the dentist is enabled to make an accurately fitted and impervious joint, quickly and without difficulty. Not only can he dismiss bands from further consideration, but he can actually conceal the line of junction by his art.

This is one of the many important advantages resulting from the combination of features which has made the Davis Crown pre-eminent for strength and durability of attachment in both crown-work and bridge-work.

That Live-Tooth Appearance

of the Davis Crown is the most natural and beautiful adornment obtainable for high-class work.

Get the new Davis Crown Booklet from your dealer, or write to

Consolidated  Dental Mfg. Co.
NEW YORK

Philadelphia

Cleveland

Detroit

Boston

Chicago

Consolidated Porcelain Teeth



—that Live Tooth
Appearance

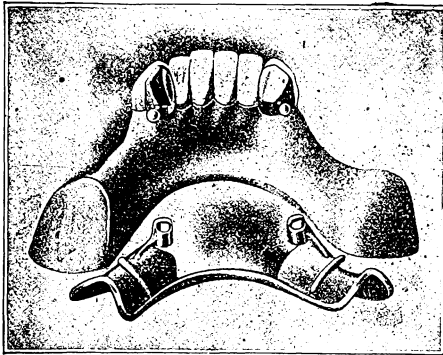
The Improved Roach Attachment

PATENTED

The purpose of this attachment is the more secure anchoring of partial dentures with the least possible strain upon anchor teeth, and to minimize their injurious effects upon remaining teeth and gums.

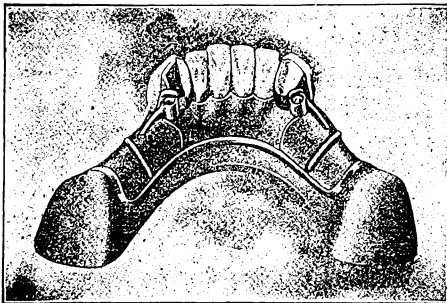
The ball and socket feature eliminates the leverage on teeth to which attachment is made, also obviates the necessity for paralleling. This feature places the attachment in a class all its own.

Directions with each attachment.



Part 1 is a $\frac{3}{4}$ round tube made of clasp gold 24 gauge.

Part 2 is a solid ball with a short stem and is made of 20-karat gold or platinum. The parts are machine made, so that they are of uniform size, interchangeable and are adapted for use with gold, vulcanite, porcelain, cast aluminum or any desirable base.



The ball, part 2, may be secured to the anchor tooth by means of gold or porcelain crowns, gold inlays, gold or amalgam fillings.

The Improved Roach Attachment

PATENTED

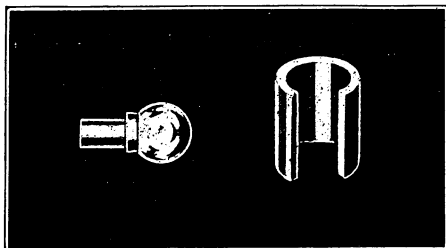


Fig. A.

Figure A shows ball and tube as prepared for use. Figure B shows the tube flattened on one side and a piece of No. 16 gauge wire correspondingly flattened to facilitate soldering and to minimize bulk at that point. Figure C shows the tube and wire held in a pair of pliers ready for soldering; also a posterior view of the same appliance, showing how one end of the wire is bent over the top end of the tube, and the other end is formed into a loop for the attachment of the vulcanite.

Directions for attaching to Gold Crowns, Porcelain Crowns, Cast Gold Inlay and other methods will be sent on application.

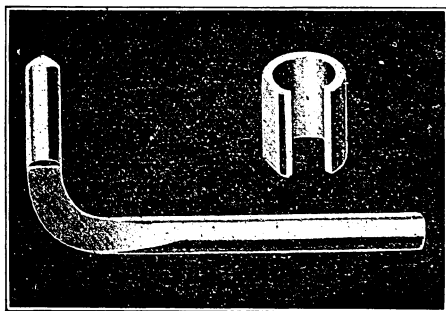


Fig. B.

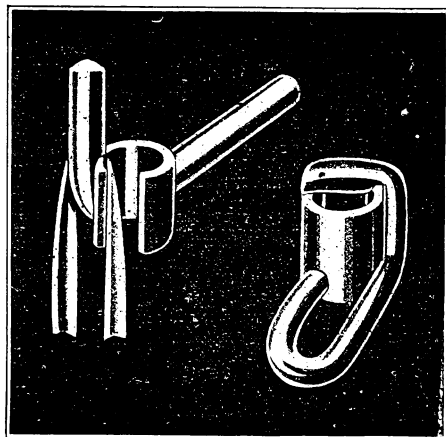


Fig. C.

PRICES

No. 627R—Each (Fig. A)	\$1.50
No. 627RA—Part No. 1 ($\frac{3}{4}$ round tube), each	.50
No. 627RB—Part No. 2 (Solid Ball, Gold), each	1.00
No. 627RC—Part No. 2 (Solid Ball, Platinum), each	1.50

FOR SALE AT ALL LEADING DENTAL DEPOTS

Consolidated Dental  Manufacturing Company
NEW YORK



To produce successful gold castings use

CONSOLIDATED CASTING WAX

For Models

AND

CONSOLIDATED CASTING COMPOUND

For Investments

Scientifically Correct

Practically Correct

PRICES

Consolidated Casting Wax, \$.50 | Consolidated Casting Compound, \$.50

PER BOX

PER CAN

Accompanied by directions for use

FOR SALE BY ALL LEADING DENTAL DEALERS



Triggs Dental Charts

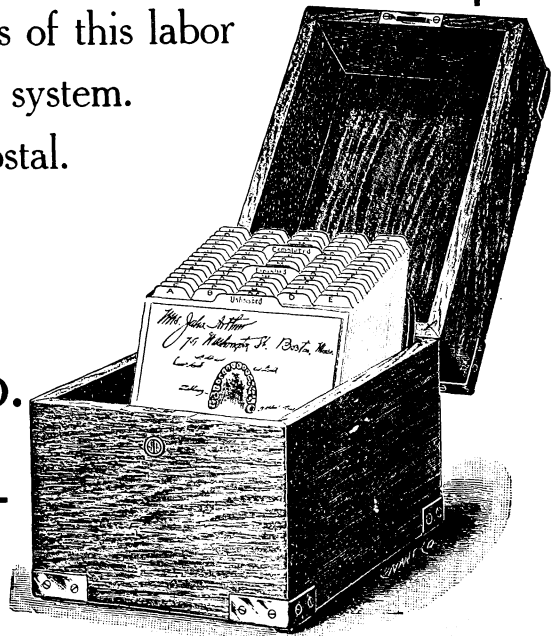
You can tell at a glance how any account stands if you use this system of dental book-keeping. One card tells the story of the operations performed, the dates and the price. The same card records the money received. The whole amount is before you on one card. This system was the first offered to the dental profession, and to-day it still leads because of its convenience, its finely finished Bristol Cards and clear lithographed illustrations.

Send for sample charts of this labor
and time-saving system.

Yours for a postal.

Consolidated

 Dental Mfg. Co.
 New York

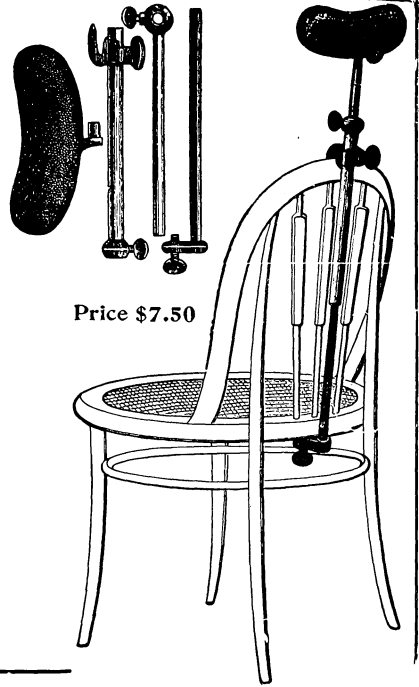


Portable Head-Rest

Every dentist should have a Portable Head Rest in his office always ready for use in case of emergency. It is especially useful for short examination of transient patients when the operating chair is occupied. An appointment can thus be made quickly without waiting for the vacancy of the operating chair. At the low cost of \$7.50, the expense of an additional operating chair may, in many cases, be avoided. For traveling dentists it is an ideal contrivance. Its simplicity, together with its wide adaptability and easy adjustment to any ordinary chair, eliminates the necessity of Portable Dental Chairs entirely.

It is compact when taken apart, the longest rod being only 12½ inches long and the whole may be carried in a small bag. When properly adjusted to the chair, the attachment becomes as rigid as the chair itself.

It is strong, well finished, nickel plated, and designed to withstand the wear and tear of much handling. The Rest itself is upholstered in maroon plush. When once included in the office equipment, its usefulness places it among the necessities of a modern practice.



Price \$7.50

PORTABLE STAND

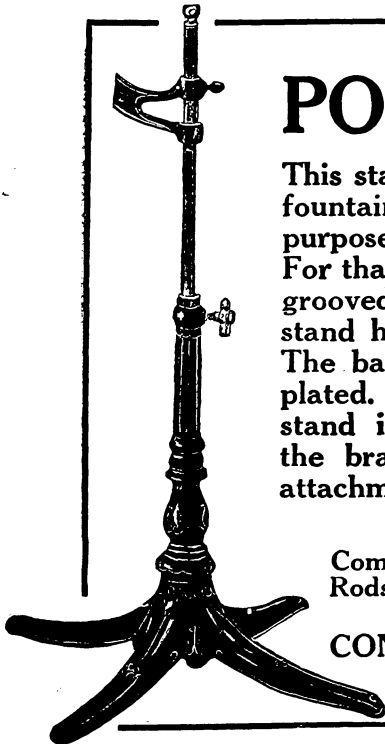
This stand is commonly used for supporting the fountain spittoon. It is also used for the same purpose as the Combination Chair Attachment. For that purpose we furnish a special upright rod grooved to hold the bracket table arm. This stand has an ample base and is perfectly rigid. The base is Japanned and uprights are nickel-plated. Full height, 43 inches. Specify whether stand is to be used for holding spittoon or for the bracket table arm and other combination-attachment parts.

PRICE

Complete	:	:	:	:	\$8.00
Rods, separately, each	:	:	:	:	1.75

CONSOLIDATED  DENTAL MFG. CO.

NEW YORK



No. 17



CUSPIDOR, STYLE A

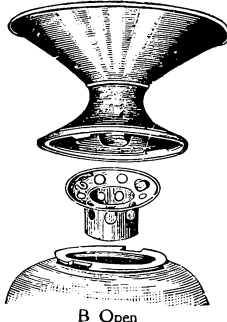
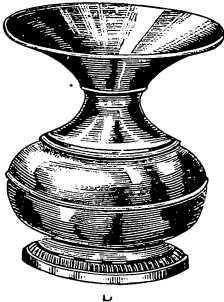
Made of spun brass with all the seams soldered, rendering them absolutely tight. Nickel-plated and handsomely finished throughout. It is fitted with a cap to hide the interior of the cuspidor from view, but in no way obstructing the flow of liquid matter.

PRICE

Each.....\$1.50

No. 18

CUSPIDOR, STYLE B



Style B is fitted with a large, agate-enameled cup which rests on the shoulder of the bowl. The cup is non-corrosive and easily cleaned and sterilized. It forms an antiseptic lining for the cuspidor. Excretions do not adhere to it, and there is consequently no odor. Without this cup a cuspidor cannot be kept antiseptically clean.



The perforated gold-catcher fits inside the agate cup. All parts are easily removable for cleaning. When closed the shoulder-joint is absolutely tight. Made of spun brass and heavily nickel-plated.

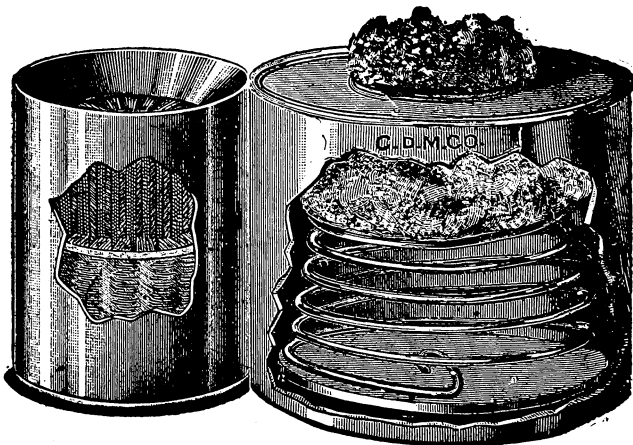
PRICES

Complete.....\$3.00
No. 18A, Agate Cups. each, .15

No. 24.

Style C Cotton Holder

With Richards' Waste Cotton Receptacle and Tool Cleaner.



As illustration plainly shows, this device is simply a combination of Dr. Richard's invention, slightly modified with our style A, or Methot's pattern, Cotton Holder. Cut shows interior view of each of the cylinders. Every dentist can appreciate the advantages which this combination offers.

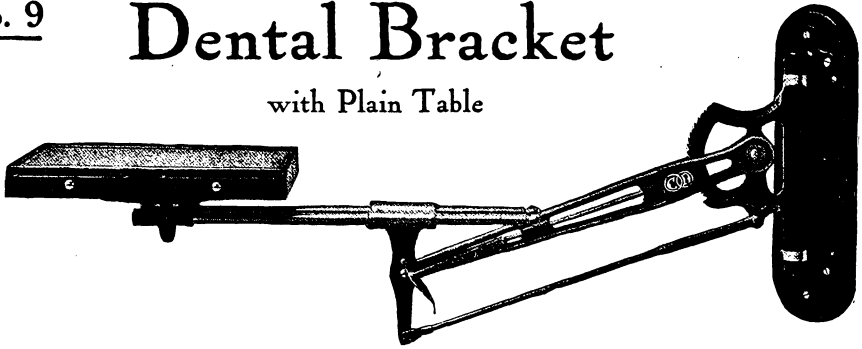
Price, Handsomely
Nickel-plated, \$1.10

CONSOLIDATED  DENTAL MFG. CO.
NEW YORK

No. 9

Dental Bracket

with Plain Table



THIS bracket is strong, convenient, easy to adjust, neat in appearance, and decidedly practicable. Pressure of the forefinger upon the trigger releases the ratchet so that the arm can be raised or lowered with one hand. The arm is held securely in the desired position (always horizontal) by steel teeth which fit into the ratchet. The design and construction permit its easy adjustment to many positions, in all of which it is held rigidly to prevent shaking or rocking of the table. The table revolves on a pivot and can be extended or withdrawn on the sliding parallel bars to which it is attached. The full length, when extended, is 44 inches; when drawn back, 10 inches. The table has a horizontal range of 12 inches, and its vertical range is 23 inches. The bracket has a swing of 46 inches. The table has two shallow drawers which can be pulled out from either side. Brackets are fitted with walnut board; oak furnished if specified.

FINISHED IN THREE DIFFERENT STYLES

No. 9A—Nickel-plated throughout.

No. 9B—Black enamel finish on castings and nickel-plated rods and tubing.

No. 9C—Antique copper finish throughout.

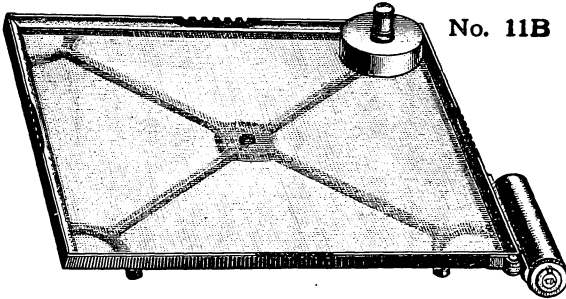
PRICES

Bracket No. 9A, 9B or 9C

With Plain Table, as shown	\$15.00
With Wood Panel Sides, Allan Table (oak or walnut).....	20.00
With French Plate Mirror Sides, Allan Table (oak or walnut)	22.00
Without Table	12.00
Table.....	3.00
With Mahogany Allan Table, add to above prices	2.00

FOR SALE AT ALL LEADING DENTAL DEPOTS

CONSOLIDATED  DENTAL MFG. CO.
NEW YORK



No. 11B

Aseptic Bracket- Table

Sterilizable

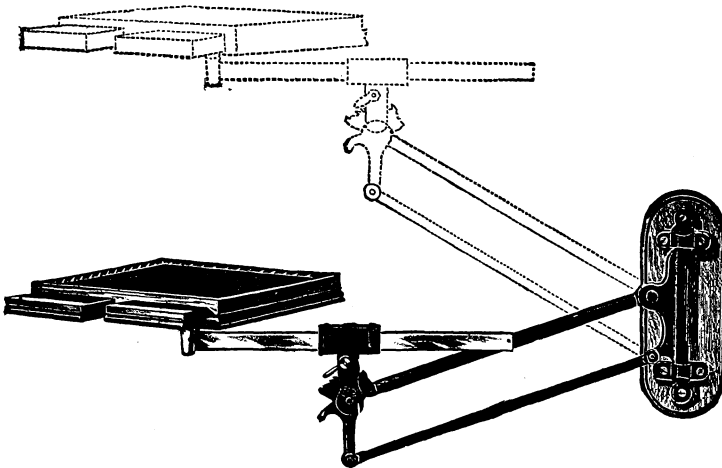
THE glass plate can be removed easily by lifting the inner rim or flange. Wrenches, screw-drivers or other tools are not required to take the table apart, and it can be cleaned and sterilized frequently without inconvenience. It is rigid and strong and does not rattle. The all-metal alcohol lamp fits into a socket, and an automatic feeding cotton-holder with swinging cover is placed conveniently. The glass plate is ground on one side and polished on the other, and is reversible. The outer rim is grooved to provide a rest for operating instruments.

Size of plate, $12\frac{1}{2} \times 12\frac{1}{2}$ inches.

The rims, lamp and cotton-holder are heavily nickel-plated and present a handsome appearance. The whole is supported by a metal frame with a central pivot for attachment to bracket.

Price, complete, with Alcohol Lamp and Cotton-holder, \$15.00

CRESCENT WALL BRACKET



This wall-bracket is designed to meet the demand for a light, strong, well made and neatly finished bracket at a low price. It is easily adjusted and held rigidly in any position. It swings in the sockets attached on the board and is easily placed flush against the wall. The raising and lowering is controlled by a single trigger, which also holds the bracket in any desired position. At any height the table is always in a horizontal position. The round rods of the bracket are made of steel and finished in black; the sliding rod and bright parts are nickel-plated. It is fitted with a polished oak or walnut board for fastening bracket to plastered walls or light woodwork. Total length, when extended, $44\frac{1}{2}$ inches; when drawn back, 28 inches.

Price complete, without table \$8.00
Price of table 3.00

FOR SALE AT ALL LEADING DENTAL DEPOTS

CONSOLIDATED DENTAL MFG. CO.

NEW YORK

Listerine Tooth Powder

Tooth powders have long been empirically employed, chiefly as a mechanical agent for cleansing the teeth, and with little regard to their composition or chemical action. Many of the articles sold for this purpose contain ingredients prone to fermentative action in the mouth, such as orris root, starch, sugar, etc., and, in addition, pumice stone, cuttlefish bone, or other harmfully abrasive substances.

Listerine Tooth Powder, possessing neither of these objectionable qualities, very acceptably meets all the requirements of a frictionary dentifrice, and promises to give much satisfaction to those who employ it, in conjunction with a mouth-wash of Listerine, suitably diluted.

To dental practitioners of record, the manufacturers will be pleased to send a supply of samples of Listerine Tooth Powder for distribution to patients.

Lambert Pharmacal Co.
Saint Louis

WANTS. FOR SALE ETC.

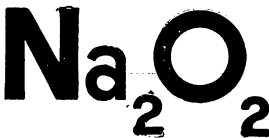
EXCHANGES

EXCHANGES

- 5405—FOR SALE—Dental office averaging \$300 monthly. No competition. Model climate; best mining district in Mexico. Good reasons for selling. Don't answer unless you have \$500 cash. Address "X." care Mexico Dental Supply Co., Saltillo, Mexico.
- 5406—FOR SALE—\$7000 dental practice; best located and equipped modern office in Baltimore, Md. Death reason for selling. Address L. B. WILSON, administrator, No. 1203 F St. N. W., Washington, D. C.
- 5407—FOR SALE—Two offices I have, but cannot handle both. Will sell one of them. Both good in public thoroughfares of Brooklyn. Take your choice and I will handle the other. Address "F. B. S." care "Items of Interest," No. 130 Washington Place, New York.
- 5408—FOR SALE—Dental practice and office fixtures in Denver, Colo. Established fifteen years. Best location in city. Light pleasant offices; rent reasonable. Address "No. 5408," care "Items of Interest," No. 130 Washington Place, New York.
- 5409—WANTED—Dentist of recognized ability, good appearance, sterling qualities, seeks position in office where services will be appreciated. Would take charge of practice for owner during illness or otherwise. Would like to associate with dentist with partnership in view. Have complete dental equipment. Mean business and not afraid of work. Can command trade and produce results. Registered in Missouri, Tennessee, Nebraska, Texas and Kansas. Address DR. FORD, Lock Box 1005, Station G, Toronto, Canada.
- 5410—FOR SALE—Wilkinson chair, gas outfit, S. S. White forceps, Allan bracket, S. S. White engine, time vulcanizer and all office and laboratory instruments at one-third cost. Address R. H. JONES, Marquette Apartments, Wilmington, Del.
- 5411—FOR SALE—Good practice for sale. For particulars address "DENTIST," Belgrade, Montana.
- 5412—FOR SALE—Established cash practice; Boston suburb, 11,000 population. Sell \$400. Reason. other business. Stand investigation. Address "C." Consolidated Dental Mfg. Co., No. 120 Boylston St., Boston, Mass.
- 5413—FOR SALE—\$1200 buys a modern equipped office, invoices at \$1000, practice \$2500, in a growing city of 17,000 in southwest Louisiana. Delightful climate. Address "E." care

- "Items of Interest," No. 130 Washington Place, New York.
- 5414—FOR SALE—Virginia practice and outfit. Three thousand inhabitants. Only dentist. Address "D. E. H." care "Items of Interest," No. 130 Washington Place, New York.
- 5415—FOR SALE—In a most desirable section of Harlem (New York City), a fully equipped dental office with all modern appliances (house furniture, lease and practice included); income, \$3500-\$4000; can easily be increased; between two subway stations; cheap rent. Forced to sell on account of ill health. \$1000 cash buys all. Only those that mean business need apply. Address "HARLEM," care S. S. White Co., 5, 7 and 9 Union Square, New York City.
- 5416—FOR SALE—Must give up \$5000 practice on account of health. A snap. Address J. T. INGERSOLL, Minneapolis, Minn.
- 5417—FOR SALE—In Washington, D. C. A rare opportunity for a first-class man. An old established practice in Washington, D. C., fully equipped with modern improvements, consisting of reception and operating room, office furniture, fixtures, and library, to be sold at a very reasonable price. Lease transferable. Illness the reason for selling. Please apply at once to the W. A. LOCKWOOD DENTAL CO., No. 1208 G St. N. W., Washington, D. C.
- 5418—WANTED—An assistant who is capable. Send particulars in first letter. Address "CAPSULE," care "Items of Interest," No. 130 Washington Place, New York.
- 5419—FOR SALE—Ethical practice, fine equipped office, best location in city of 40,000 inhabitants; can be bought for \$2500. Those without cash need not apply. Address "L." care Consolidated Dental Mfg. Co., Philadelphia.
- 5420—WANTED—Experienced dentist would buy practice, partnership or work as assistant. Good extractor; local or general. Address "No. 5420," care "Items of Interest," No. 130 Washington Place, New York City.
- 5421—FOR SALE—If at once, at inventory, account sickness, \$3000 cash practice; Massachusetts town 15,000. Established 11 years; part cash. Address "No. 5421," care "Items of Interest," No. 130 Washington Place, New York City.

Dental Sodium Dioxide
For **BLEACHING**
STERILIZING
4 in 1 SAPONIFYING
OBTUNDING



Regarding application read Am.
Text Book Op. Dentistry (3d Ed.)
\$1 per Tin from Dealers or
ROESSLER & HASSLACHER CHEM. CO.
NEW YORK

- 5422—FOR SALE—Practice and office fixtures for invoice price of fixtures, in a live northern Illinois town of 9000. Going into business with brother. Address "R. C.," care Consolidated Dental Mfg. Co., Chicago, Ill.
- 5423—FOR SALE—Practice in Chicago at inventory. Established five years, located on prominent transfer corner. Address "WINNER," care Consolidated Dental Mfg. Co., Chicago, Ill.
- 5424—FOR SALE—Good practice and office in Oklahoma college town of 2500. No competition. Price \$700 cash (invoice). Reason, going to Europe. Address "No. 474," Tishomingo, Oklahoma.
- 5425—FOR SALE—Established advertising practice. Address "HOWARD," care "Items of Interest," No. 130 Washington Place, New York.
- 5426—FOR SALE—Eight shares Borine stock 8 per cent. preferred for \$70. Address "STOCK," care "Items of Interest," No. 130 Washington Place, New York.

WASHINGTON

QUIZZING for this and other State Dental Examining Boards. For full information as to requirements, time and place of meetings, fees, etc., address

DR. ARTHUR JORDAN,
Nos. 301-302 Oriental Block, SEATTLE, WASH.

Tyree's Antiseptic Powder

BROOKLYN, N. Y., Aug. 9, 1905.

J. S. TYREE, Washington, D. C.

DEAR SIR:—I am using the sample of your Antiseptic Powder which you sent me and can truthfully say that it possesses all of the virtues that you set forth. As a root canal treatment in conjunction with creosote, it excels any preparation I have ever used. In surgical cases I have found it far superior to Iodoform, Aristol, etc.

In a case of empyema of the maxillary sinus which came to me recently it has worked wonders, and many different cases which came under my care. In pyorrhea, I use a strong solution of the Antiseptic Powder, having first sealed the roots of the teeth, then I pack small quantities of the Powder between the necks of the teeth and gums.

I might add that the results are gratifying. It is a specific in Leucorrhea. In view of its many virtues I recommend it to my professional friends whenever the occasion presents itself.

Yours very truly, DR. J. M. WOODLE.

FREE—I want every dentist to test this Powder at my expense. I will send a box free of charge upon request. No publicity will be given requests for samples or booklet on Dental Antiseptic.

J. S. TYREE, Chemist, Washington, D. C.

PYORRHEA GERMS

The supreme importance of a crusade against this scourge, is beyond question.

Sound education in dental hygiene teaches that the pus forming germs of Pyorrhea are the Staphylococcus and Streptococci.

The following assertion is a strong one, but we can give conclusive proof based on scientific facts that it is true.

KOLYNOS DENTAL CREAM will destroy the germs of Pyorrhea.

Pack Kolynos into the Pyorrhea pockets, and see for yourself how it will clean up the flow of pus.

We invite your personal investigation, and ask you to study carefully the reports we shall be glad to forward you with a free full size tube of Kolynos.

THE KOLYNOS COMPANY

180 MEADOW STREET,

NEW HAVEN, CONN.

How Much Money

do YOU intend to waste on spurious casting machines before buying a Taggart and saving YOURSELF time, money, and trouble?

How long do YOU intend to handicap YOURSELF by guesswork?

How long before YOU realize that, for the casting process to be an exact one, correct principle instead of price must govern the selection of a machine?

A controllable nitrous oxid blowpipe is necessary for bringing gold rapidly to a state of fluidity without disintegrating the plaster, a nitrous oxid blowpipe is an expensive adjunct but without it a casting machine is as antiquated as a 1902 automobile.

Positive pressure is necessary to force this thin liquified gold into every interstice.

Positive sustained pressure or holding force is necessary to overcome contracting force of gold.

An accurately adjusted pressure plate is necessary to prevent escape of pressure or holding force at a critical moment.

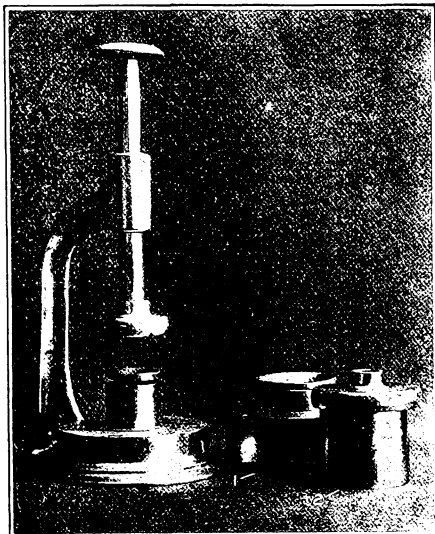
A pressure gauge is necessary to determine exact amount of pressure used, this pressure to be governed by the character of metal used and size of casting.

The only Casting Machine which provides for all these requirements is the TAGGART.

In ordering for foreign shipment, specify make of cylinder used

**TAGGART CAST INLAY CO.
MASONIC TEMPLE, CHICAGO, ILL.**

The New Seymour Casting Machine



THE only low-priced machine with complete capacity, covering from an inlay to a full plate by the use of the ordinary gas or gasoline blowpipe; compressed air or electricity not needed.

PRICE, COMPLETE, \$10.00

This carries two cups, one investment guide, small box of investment material, wax, and covers all inlays, caps, crowns, small bridge or saddle.

EXTRA PARTS

Full plate cup using same guide and plunger cap as large bridge cup \$1.00
Large bridge cup outfit consisting of three parts, cup, guide and plunger cap 1.50

Sold direct and by all Dental Manufacturing Companies and Dealers, including Foreign houses.

Endorsed by:

PEESO POST-GRADUATE SCHOOL OF CROWN AND BRIDGE WORK,
Philadelphia, Pa.

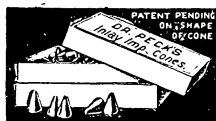
THE CAPON SCHOOL OF DENTAL CERAMICS,
Philadelphia, Pa.

For particulars
address:

ROBERT SEYMOUR, D.D.S. Room 300, Perry Building, 16th and
Chestnut Sts., Philadelphia, Pa.
CANADIAN BRANCH: W. J. SEYMOUR, ARKONA, ONT., CANADA

Peck's Gold Inlay Impression Cones

POINTS OF ADVANTAGE IN THIS IMPRESSION MATERIAL:



It softens readily under dry heat.
It will not creep under the spatula.
It is tough and can be carved perfectly.
It can be removed from the cavity without fear of distortion.
It is hard enough so that handling will not change its shape.
It will not warp while placing the sprue in position.
It is molded in a convenient form to use.

Ask the Dental Depot for FREE sample.

Price per box, Sixty Cents

Sold at all Dental Depots

Great Reduction in Peck's Investment Compound

Owing to extensive improvements in manufacturing facilities the price of the regular can which sold for \$1.00 is cut to 50 Cents

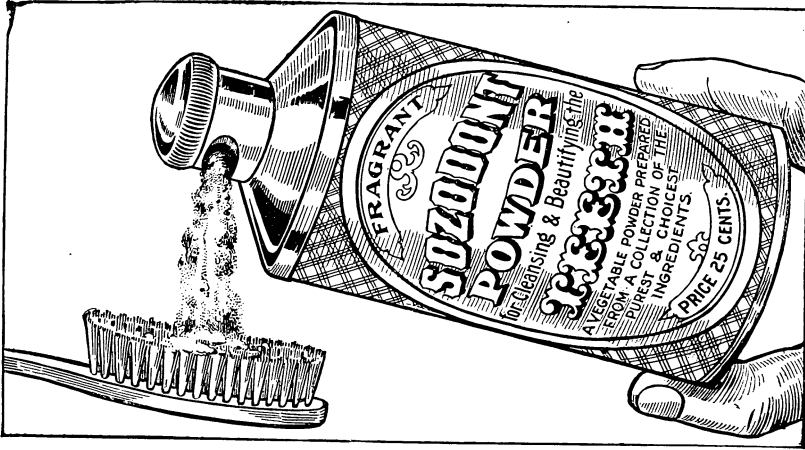
I am now placing on the market a much larger can which retails for 75c.

Order the BEST and be sure of your results

Ask your Dental Depot for FREE sample

ARTHUR E. PECK, M.D., D.D.S., 1002 Donaldson Building,
MINNEAPOLIS, MINN.

Sozodont Tooth Powder Keeps Gold Work Bright



IT possesses also in addition to its alkaline, astringent and detergent properties, three other characteristics of prime importance for the maintenance of oral hygiene. *It is antiseptic, absolutely unfermentable,* and so smooth that when a portion is rubbed between two fingers or the palm and fingers, *not one particle of grit* can be detected. It is composed of the purest ingredients obtainable and so perfectly blended that there is no residue to react upon the tooth structure or upon any substances used for filling and crowning.

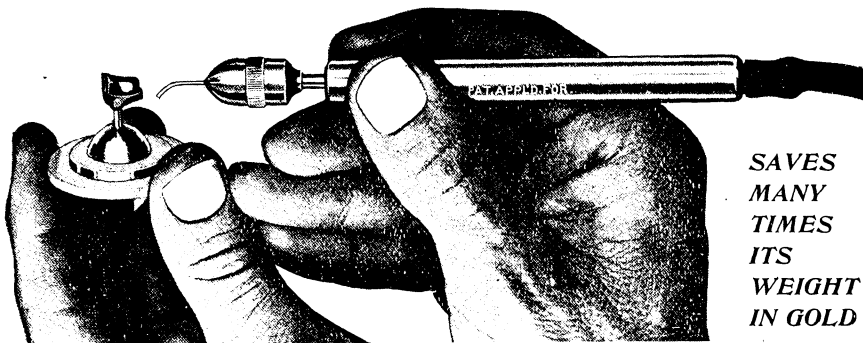
So far as we know, it is the only tooth powder absolutely fulfilling all abrasive requirements without any of the injurious elements found in other tooth powders.

A recent examination of some of the prominent tooth powders on the market showed in every instance the presence of at least one of the following: Powdered quartz, cuttlefish bone, charcoal, pumice, acids, common soap, fermentable sugars and in the pastes honey was predominant. (No honey in SOZODONT Tooth Paste.)

SOZODONT TOOTH POWDER contains absolutely none of these objectionable features and the small quantity of soap used in all of our SOZODONT preparations is made from the finest imported olive oil according to the formula in the U. S. Pharmacopoeia. It is the purest, sweetest and best of castile soaps. Here are a few reasons why SOZODONT TOOTH POWDER should be the favorite for recommendation by the careful and conservative dentist.

Hall & Ruckel, New York City

**YOU ARE CHEATING YOUR PATIENT AND YOURSELF
BY NOT MAKING HOLLOW INLAYS WITH
ROACH'S SUCTION WAX CARVER**



**SAVES
MANY
TIMES
ITS
WEIGHT
IN GOLD**

SIMPLICITY CHARACTERIZES ITS USE

Just mount wax inlay on sprue wire, heat bulb, not too hot, apply point of carver to wax and, as it melts around the point, draw back into the reservoir containing absorbent cotton with suction established by the mouth piece or saliva ejector.

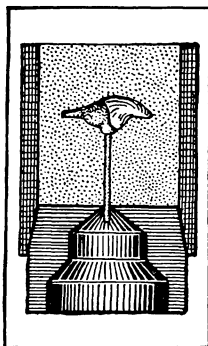
Wax can be carved as thin as paper without injury to margins.

Order one now. Try it on your next big inlay and if not satisfied you may have your money back.

INVENTION OF DR. F. E. ROACH, CHICAGO

For Sale by All Dealers

PRICE, \$4.00



THE VERNON HEATOMETER

For Casting ACOLITE

**NO FAILURES
NO BLOWPIPE
NO OVERHEATING**

Directions With Every Outfit

PRICE, \$2.00



≡ ACOLITE ≡

AN IDEAL CASTING METAL

☞ Pure, white, tasteless, takes a high polish, never discolors, casts sharp, has toughness, density and edge strength. ☞ Fuses at 500° Fr. Casts directly on any porcelain teeth. ☞ Especially adapted for restoring broken down roots and mounting crowns upon same. Crown and bridge work. A substitute in all places where gold casting is indicated. Casts with any apparatus used for gold.

PRICE, \$2.50 PER OUNCE

Prepared only by ACOLITE MANUFACTURING CO., INCORPORATED, 72 W. Lake Street, CHICAGO

FOR SALE AT ALL LEADING DENTAL DEPOTS

ANNOUNCEMENT

Price's Dental Artificial Stone

THE A. M. Price Electric Co. have arranged to manufacture and supply the Dental Artificial Stone suggested and perfected by Dr. Weston A. Price for a hard model material for constructing and casting and finishing all kinds of dental restorations upon. It gives the dentist as it were a petrified patient or at least petrified teeth to work upon. It withstands a temperature above all requirements and is very hard and smooth. For its uses see article in this journal. It is put up at present in two qualities, differing in degree of setting expansion.

Quality A has within one thousandth no contraction or expansion on setting after having been heated red hot. Quality B has an expansion of several thousandths which will be marked exactly on each package. Inasmuch as all silicate cements of definite reaction are very difficult and exacting to make, and therefore necessarily expensive, this material is especially so since it controls entirely the usual considerable contraction. We have tried to make the price as low as possible.

16 oz. package powder, quality A, and liquid for same . .	\$4.00
8 oz. package powder, quality A, and liquid for same . .	2.25
4 oz. package powder, quality A, and liquid for same . .	1.50
16 oz. package powder, quality B, and liquid for same . .	4.50
8 oz. package powder, quality B, and liquid for same . .	2.75
4 oz. package powder, quality B, and liquid for same . .	1.75

Since an accurate impression is the first essential to produce accurate results, both an excellent and suitable impression material and a suitable set of casting impression trays are furnished with the stone at the following prices:

Impression material, per package	\$.50
Set of nine trays suggested by Dr. Price	2.00

Different cases require a different length of septum, hence trays Nos. 5, 6, 9 and 11 as shown in article are made in three sizes, also 10 and 12, and the medium size only is included in the above set of nine. Extra trays of the assorted sizes are desirable, also duplicates of the forms likely to be in use. Trays Nos. 3, 10 and 12 are fifteen cents each, all others 25 cents each.

The micrometer gauge articulator is very desirable both for producing accurate contact points and occlusions, and also for measuring the exact contraction and expansion of the stone, making a very close accuracy possible. This instrument is shown in Figure 7 of the article. It has a double Vernier scale reading in both hundredths and thousandths of an inch, price \$5.00. A large plate glass slab and large German silver spatula and double ended inserting spatula are supplied at 25 cents, 75 cents and 50 cents respectively.

Orders not accompanied by cash will be sent C.O.D.

This method or process is not and will not be patented.

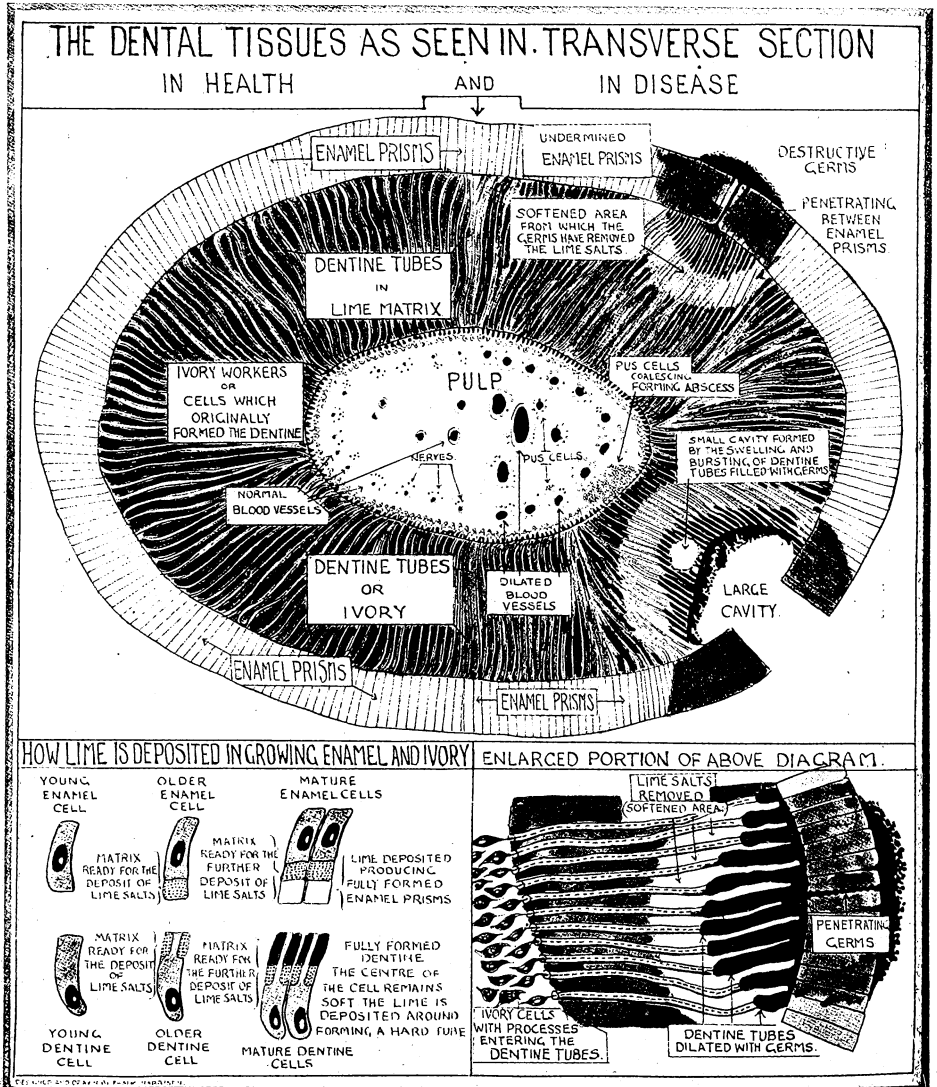
The A. M. PRICE ELECTRIC CO.

11809 Euclid Avenue, Cleveland, Ohio

This is a Reduced Illustration of one of a Series of Eight
Popular and Literary Drawings Illustrating
THE TEETH IN HEALTH AND DISEASE

By FRANK HARRISON, M.R.C.S. (Eng.) L.D.S. (Ed.)

Dental Surgeon to the Sheffield Royal Hospital and Lecturer in Dental Surgery at the University of Sheffield.



Price of Bound Series of Eight, \$1.50

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CLAUDIUS ASH, SONS & CO. Ltd., 30 East 14th Street, New York

OXPARA

A scientific preparation for the Complete and Permanent removal of Dental Abscesses, stands to-day where it has stood for many years, at the head and front of all such preparations. The successful treatment of Putrescent Pulp has been made sure by this remedy, which depends solely upon Merit for

SUCCESS

OXPARA

Rapidly increasing sales all over the world, wherever dentistry is practiced, and hundreds of letters from enthusiastic dentists who have found in its use speedy and thorough relief from Abscess Troubles not possible without it, bear most gratifying testimony to its complete

SUCCESS

OXPARA

Is the only preparation that may safely be sealed in an abscessed or putrescent tooth. After hardening, it is not soluble in the fluids of the mouth. When properly applied and sealed, it remains continuously active, promptly conquering most stubborn cases. It is an entire and great

SUCCESS

OXPARA

Is in more dental offices to-day than any of its imitators. Careful dentists prefer to stand by the original preparation, because it is reliable and easily applied. Is ideal also for permanent root canal fillings, as its effects are lasting. When necessary may easily be removed. A time-tried and lasting

SUCCESS

ALL DEALERS

One Fifty the Box

The Ransom & Randolph Company

PROUD AGENT

TOLEDO, OHIO, U. S. A.

If you are a Doubting Thomas, send for "Putrescent Pulp and Their Treatment," and learn opinions of prominent men in the profession.

IT IS OUR BUSINESS to meet as far as possible the needs of the dental profession. The demand of our actual and possible patrons takes two forms: cheap goods and good goods.

Up to a point these demands may be joined with consistency. Beyond that, compliance with both demands is impossible.

Many dentists have had to meet an apparent demand for cheap work. Either they yield to that demand and degenerate, or they change the demand in the direction of good work.

In the long run we get pretty much what we pay for. And we can usually buy an imitation of what we want at about what we are willing to give.

But the "real thing" costs a sacrifice—either to produce or to purchase.

The L. D. Caulk Com-

pany has never believed in the policy of cutting prices; that policy has not interested us.

When competitors have set up bargain counters we have endeavored to put a little more merit into our goods. The increasing demand seems to have justified our policy.

There are numerous ways to improve goods of dental manufacture—better formulas, more advanced methods in

manufacture, insuring more absolute uniformity of product, the selection of higher grade crude materials and the employment of better qualified experts.

We believe that there is a sentiment among the profession that the Caulk goods are always right. It costs a great deal of money to establish this permanent insurance.

THE L. D. CAULK CO.
PHILADELPHIA



WHY DOESN'T CAULK'S COPPER CEMENT discolor the dentin and tooth enamel like other copper cements?

Because its powder is not all copper and because it is not loaded with cobalt.

Caulk's Copper Cement contains sufficient copper to make it a positive germicide, destroying bacteria, making it an active agent of tooth health and preservation.

The copper is combined with specially prepared zinc oxid, and thus in one cement all the virtues of the two materials are secured.

Caulk's Copper Cement has great tenacity. It will not chip or wash out but adheres, even in saucer-shaped cavities.

For this reason the pain of extensive excavation is

avoided, only the most superficial undercuts being necessary for anchorage.

It endures like the best oxy-phosphate of zinc cements and does not stain the dentin and tooth enamel like those cements which are practically all copper, charged with cobalt.

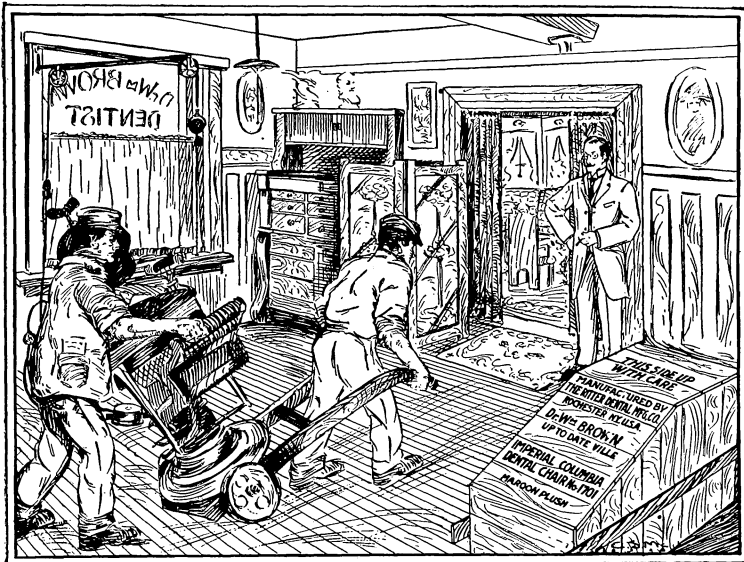
For children's teeth it is unmatched. For adult patients, where the teeth are generally decayed and broken

down, nothing can be inserted with such ease, or has such decided preservative properties.

For setting crowns on frail or chalky roots it is unrivaled. It is indicated in numerous cases in your daily practice, and should have a permanent place in every dental cabinet. Per box, \$1.50.

THE L. D. CAULK CO.
PHILADELPHIA





Replace your old Dental Chair with an Up-to-Date One

The Columbia Chair

Recent advances in dental chair mechanics make such chairs as the Imperial Columbia a great blessing to the hard-working dentist.

First. They conserve the dentist's strength. They are capable of adaptations impossible with former chairs. That eases the strain of operating. It saves the back, the eyes and the neck. Strain on these parts has worn out many a dentist.

Second. They require little manipulation to get any desired position. A few levers do it all and do it easily and quickly. And when you are busy, chair movement is a nuisance. With an Imperial Columbia Chair you will not be so tempted to work in an uncomfortable position because of the bother of changing. Changing an Imperial Columbia Chair is very little bother.

Lastly. Imperial Columbia Chairs contribute greatly to your patients' comfort—and you know how irritable discomfort makes them. It eases the back and head and induces nervous repose.

Your dealer can dispose of your old chair. You can pay the difference a little at a time if you prefer.

IMPERIAL COLUMBIA CHAIR

\$225.00 in standard finish

Other chairs at a less price, but Imperial Columbias are the best.

The Ritter Dental Mfg. Co.

ROCHESTER, N. Y.

Let a COLUMBIA ELECTRIC ENGINE

do your Excavating

It has qualities of the greatest value to you. It works rapidly, inflicts a minimum of pain and spares you fatigue and nervous strain to a degree impossible to realize until you experience it.

It will keep you in so much better physical condition that if a case requiring extensive grinding, as for a crown or bridge, comes so late in the day that you could not finish with a foot engine, your physical condition will be so much better and the required time so shortened by the Columbia Electric Engine, as to make light work of it.

When not employed the engine will so ornament your office and convey to callers such an impression of up-to-dateness as to be worth much more than its cost.

The cost, even on busy days, is so small as not to be felt. A Columbia Electric Engine will work through your busiest month at a cost of about five cents per day.

No matter where you are located, or whether or not you have electric current, you can be supplied with a Columbia Electric Engine, so arranged as to give perfect service. Fill in the coupon below and let us tell you what we can do and what it will cost.

Please alter the coupon below to give the correct description of your current.

THE RITTER DENTAL MFG. CO.

563 St. Paul St., Rochester, N. Y.

GENTLEMEN:

I have } electric current { by night } it is { alternating }
I have not } { by day } { direct }

Voltage is :

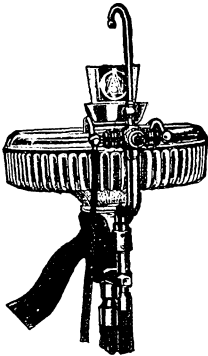
Alternations are :

I should be interested to know how you can help me with the Columbia

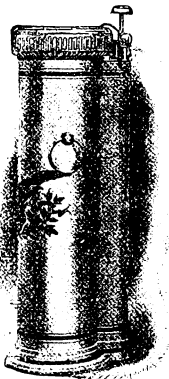
{ Electric Lathe } and what it will cost.
{ Electric Engine }



Price, \$65.00



Price, \$40.00



Price, \$40.00

Doctor:—

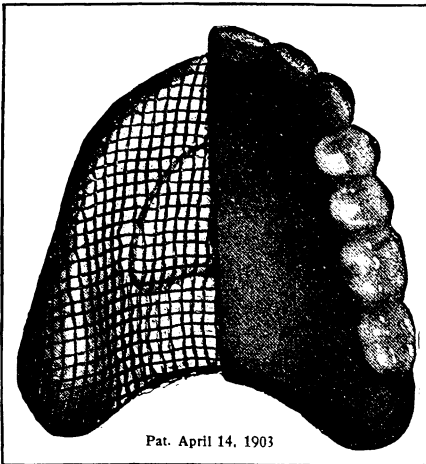
*A long time after
you have forgotten
what you paid for a
Clark spittoon, it will
be running properly,
looking beautiful, and
be a source of comfort
and satisfaction to you
and your patients.*

*Take this into con-
sideration, when buy-
ing a fountain spittoon.*

*A. C. Clark & Co.
1250 to 1268 E. 76th Street
Chicago*

We use **OUR** own system
 for making **CROWNS** That's why
 they **ARE** s o
 very **DIFFERENT** from

THOSE ORDINARILY MADE. WE KNOW THAT
 A PROPER CROWN SHOULD BE HEAVY AT THE
 CUSP AND LIGHT AT THE EXTREME NECK.



Pat. April 14, 1903

HENCE OUR SYSTEM.
 INVESTIGATE AND GET WISE.
 WE ALSO HAVE A
 WAY OF MAKING

**RUBBER
 PLATES
 FIT**

THAT IS WINNING NAME AND FAME FOR

SAML. G. SUPPLEE & CO.
 874 Broadway, cor. 18th St., New York

The Weber is the only fountain spittoon made that can't run over on your floor.

It is the only one made with an overflow like a washstand.

Make us prove it.

LEE S. SMITH & SON CO.,
Pittsburgh.

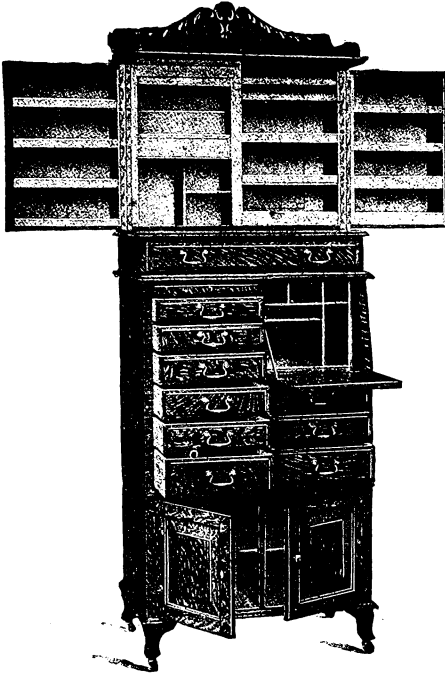
THE SKILLFUL DENTIST

If he would be successful must back up his craftsmanship with the most modern conveniences. For rapid and cleanly work a commodious dental cabinet is indispensable. Every instrument, every bit of material should be within instant reach. The Patient in the chair wants the work done as quickly as possible. He does not want to wait for the Dentist to hunt for a mislaid instrument. In one of our Modern Cabinets everything is at hand for immediate service.

¶ Proper conveniences make up half of a successful practice. We print a little booklet that tells why. It is called "Office Furniture as an Investment."

¶ We are in a position to offer some choice styles of cabinets at greatly reduced prices. If you will write us, *mentioning this magazine*, we will give you the details of this offer, and send you a copy of the booklet free,

THE AMERICAN CABINET CO.
Two Rivers, Wisconsin



No. 57. Open.

No. 57 Cabinet

When open, most instruments and supplies are at your finger tips. We have many testimonials from the users of this cabinet, who tell us it is a most convenient as well as a handsome piece of furniture.

The interior, that is exposed when open, is lined with bird's-eye maple, with a beautiful satin finish that will not scratch readily.

Our catalog describes it fully and your dealer will be pleased to send you a copy or it will be mailed direct on request.

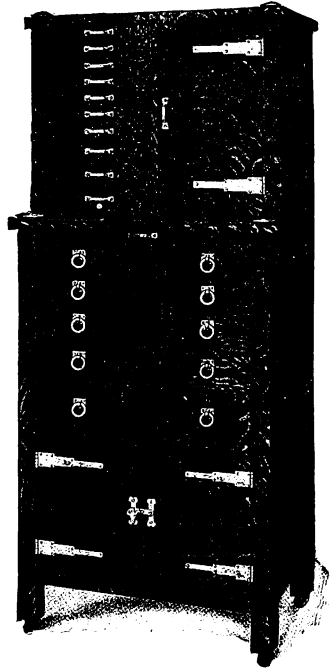
Price, Quarter-sawed Oak, \$75.00
Mahogany, - - - 90.00

No. 59 Cabinet

This cabinet has proven popular since it was first put on the market.

It is built in Mission style, with Mission finish and Mission hardware, and there is no cabinet of its price that has so many interior conveniences as this. Write for a more complete description.

Price, Quarter-sawed Oak, any
Mission finish, - : - - - \$55.00



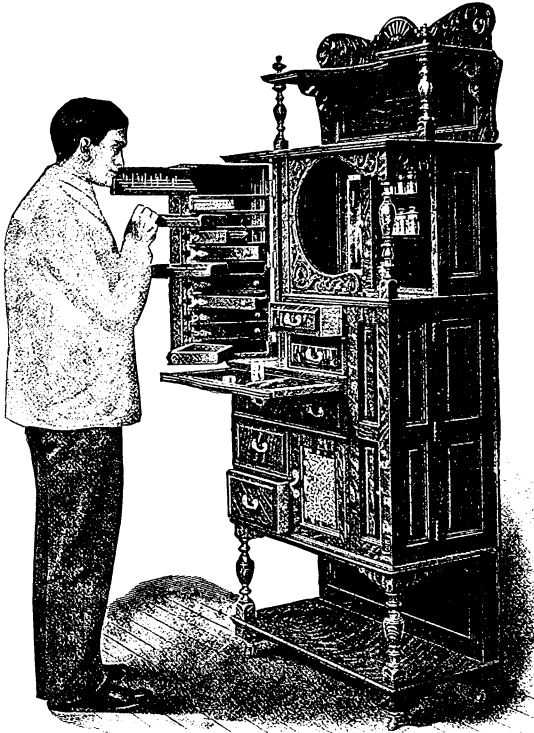
No. 59.

The American Cabinet Company

RAHWAY, NEW JERSEY

TWO RIVERS, WISCONSIN

CABINET No. 75



*Notice particularly
how convenient the
arrangement of the
swinging instrument
trays. In plain
sight and easy reach.*

THE CABINET is noticed more by your patients than any piece of furniture you buy, and, as you naturally want every patient to have a favorable impression of you and your office, you should take into consideration the effect of your purchase upon those who visit you.

Now, our Cabinet No. 75, while being convenient and commodious for the dentist, just seems

to have been designed for the patients as well. There is something about it that attracts them—that impresses them favorably, and then impels them to say a good word about your office to their friends, all of which is mighty good advertising. And the best thing about it is that it is particularly handsome when it is open, just as the patients see it during their tedious hours in your chair. The hand carving, the beautiful scroll work, the raised panels, the unique corner-hinged instrument trays with hinges of special design, all seem to appeal to them.

Better write us for "Modern Office Furnishings" for a complete description of its many conveniences.

PRICES

Cabinet No. 75, Imported Mahogany	\$110
Cabinet No. 75, Quartered Oak, any finish	95

THE AMERICAN CABINET CO.

Two Rivers, Wis.

Rahway, N. J.

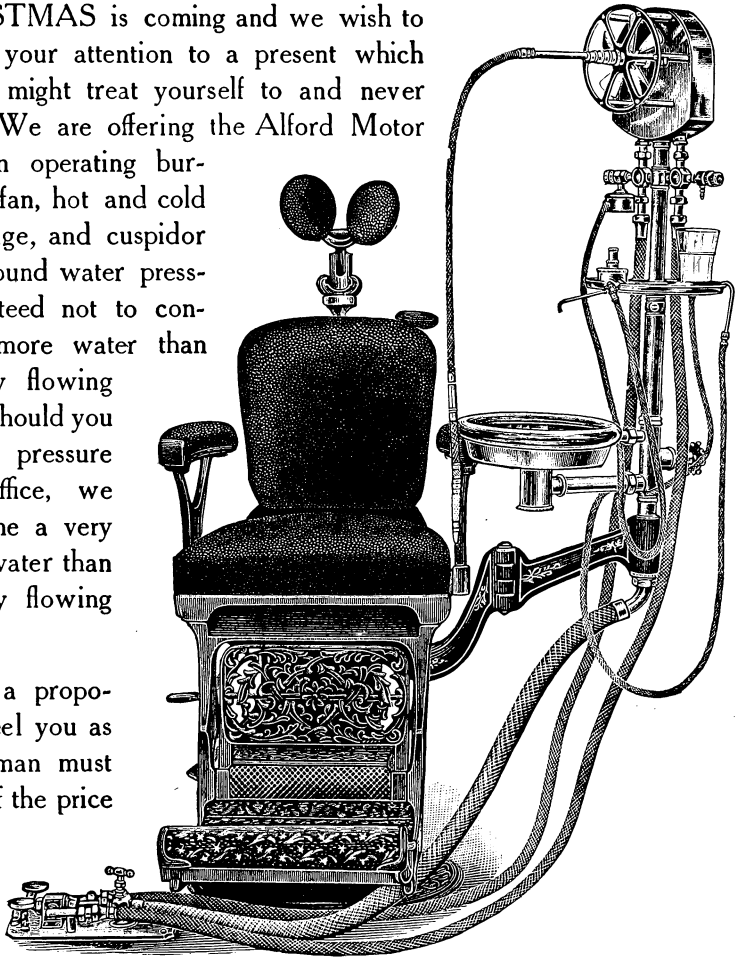
The Alford Dental Motor

CHRISTMAS is coming and we wish to call your attention to a present which you might treat yourself to and never regret it. We are offering the Alford Motor Combination operating bur-brush axle, fan, hot and cold water syringe, and cuspidor on a fifty pound water pressure, guaranteed not to consume any more water than an ordinary flowing cuspidor. Should you have a less pressure in your office, we will consume a very little more water than an ordinary flowing cuspidor.

¶ This is a proposition we feel you as a business man must appreciate if the price is reasonable, which we have considered

very thoroughly and made within the reach of all. We have decidedly the most attractive outfit ever put on the market and accomplish more in less time.

¶ This is a very progressive age we are living in, and if you expect to continue to practice do not fail to thoroughly investigate this proposition. Write for Catalogue. Do it now.



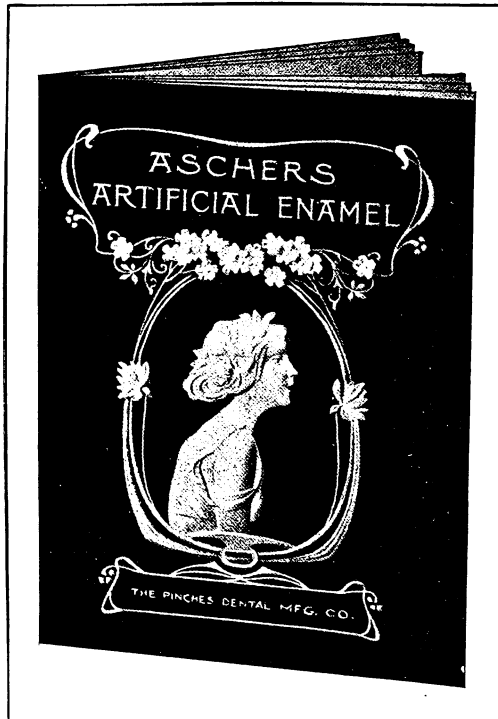
Alford Dental Motor Mfg. Co.
SUMTER, S. C., U. S. A.

FREE BOOK ON CEMENTS

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The Handsomest and Most Instructive Book ever issued on the subject. Contains Eighty Pages of Interesting and Scientific Articles, Beautifully Illustrated. Write name and address plainly on a postal

THE PINCHES DENTAL MFG. CO.

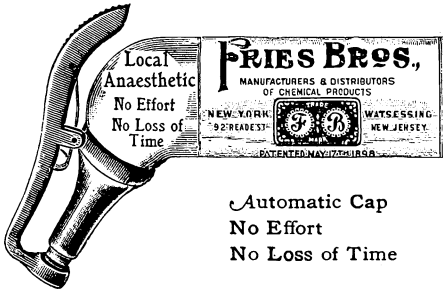
1181 BROADWAY,

NEW YORK

LOCAL ANAESTHETIC

Send \$1.10 for large 30 gram sample Automatic Tube; or for \$1.00 a Double Ended Tube will be sent postpaid in the United States. Safe delivery guaranteed.

Write for literature on FORMALDEHYDE-KELENE, for use in Hay Fever, Catarrh, etc.



Automatic Cap
No Effort
No Loss of Time

"KELENE" (pure chloride of Ethyl)



See **GOLD MEDAL** awarded at the Jamestown Exposition

We also furnish a graduated tube for the use of KELENE in GENERAL ANAESTHESIA, also as a preliminary to Ether. Each tube contains 50 C. C., and costs \$1.60. Safe delivery guaranteed.

Always ready for instant use. Easily applied with uniform results. Convenient to carry. Harmless, no matter how frequently applied. Avoids use of Hypodermic Needle.

Write to sole manufacturers for full particulars, Clinical Reports, etc.

FRIES BROS. Manufacturing Chemists 92 Reade Street, New York

Oxolint

ABSORBENT LINEN

absorbs instantly yet will not mat or pack. It is most gratefully cooling and soothing to any wound.

Physicians and Surgeons appreciate the superiority of Pure Linen as an absorbent. Oxolint is every particle linen, and is so guaranteed.

Oxolint is pronounced by Dentists, Surgeons, Nurses and Druggists who have examined it to be "the ideal dressing"—hygienic, non-irritating, antiseptic, and as remarkable for its retentiveness as for its absorbency. It is also peculiarly free from adhesive fuzz.

Oxolint is the result of a recently discovered process of separating flax from straw and converting it into pure linen at a saving of many weeks over the old methods and at a great reduction from the former cost of production. This process is controlled by the Oxford Linen Mills.

We would like very much to have every dentist prove to his own satisfaction the superiority and general excellence of Oxolint.

A SAMPLE FOR TESTING PURPOSES will be sent free on request.

OXFORD LINEN MILLS, 89 Oxford Street, North Brookfield, Mass., U.S.A.

IN THE MOUTHS OF MANY

Welch's

Gold & Platina Alloy

has proved its case. Forty years the favorite. A pioneer. Still the leader of high grade alloys. Readily amalgamated, unusually plastic and cohesive for the largest contours.

One Troy oz., \$2.50; five oz., \$11.00; ten oz., \$20.00. Also in half-oz. packages, \$1.25.

Dr. Welch's Amalgam of Silver and Tin \$2.00 per oz.; \$7.00 for four oz.; \$15.00 for ten oz.

Samples on request.

T. B. WELCH CO.

5919 Woodbine Ave., Philadelphia, Pa.

An Open Discussion

The One Piece Crown *vs.* The Two Piece Crown

DR. CURIOUS:—What do you mean by a One Piece Crown?

Well, Doctor; we mean that with our system, a Gold Crown can be made from a piece of 28 or 30 gauge plate in much less time, and cost from 25 cents to \$1.00 less, be more natural in appearance, better articulation obtained, easier to make, and in every sense more satisfactory than any method of making a Two Piece Crown

DR. BUSYMAN:—How is it a quicker method?

Because no time is spent in taking impressions, making dies, striking up cusps and fitting to bands, soldering and finishing.

DR. ECONOMY:—How are you able to make this saving in cost?

From the fact that the entire crown is made from one piece of plate, eliminating all waste in soldering and filing off excess, and the time saved in the process.

DR. ESTHETIC:—We are aware that the Two Piece Crown usually lacks the beautiful form of a natural tooth. In what respect do you improve on this?

Our method provides for a perfect contour, insures correct occlusion, and is in all respects anatomically correct.

DR. PROGRESS?—Is this system so perfected that any lady assistant can make these crowns?

Yes, Doctor. The method is exceedingly simple. There are many Dentists to-day who are using our Outfit, who previously sent their crown work to laboratories, paying anywhere from \$1.50 to \$3.00 per crown. The actual cost of material varying from 50 cents to \$1.25. The assistant is now saving this difference, and the results in all respects are much more satisfactory.

Your method appeals to us as being superior. Now if you will just go on with your description and show us all about it, we will be further interested.

This is just what we would like to do, but our limited space in this journal prevents giving a detailed description. However, we have it in printed form, and would be pleased to send you a copy upon application.

Can the Dental Supply Houses furnish your Outfit?

Yes, or you can send your order direct to us, stating from what dealer you wish to make this purchase.

What is the price of a Complete Outfit?

We recommend our No. 3, price \$40.00
or No. 4, price \$45.00

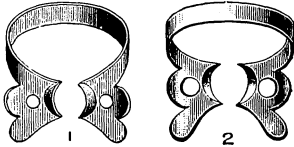
THE W. M. SHARP COMPANY

46 N. 12th Street, PHILADELPHIA, PA., U. S. A.

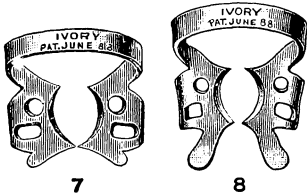
JUST A FEW PATTERNS

OF THE

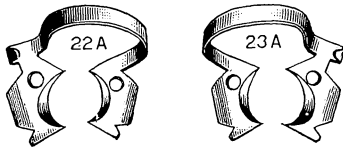
Ivory Rubber Dam Clamps



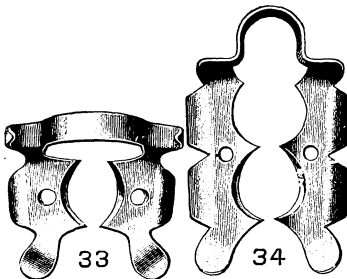
Nos. 1 and 2
Universal Bicuspid Clamps
Price, each, 60 cents



Nos. 7 and 8
Universal Molar Clamps
Price, each, 60 cents



Nos. 22A and 23A
Are Buccal Cavity Clamps, Right
and Left
Price, per pair, \$1.20



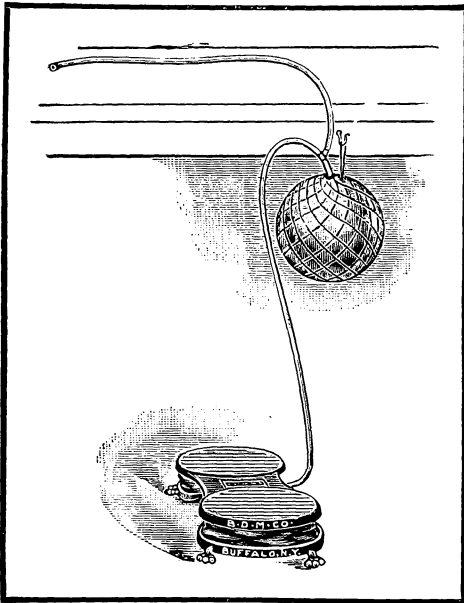
No. 33
Compensating Bow, will stay on a
Molar at any Angle
Price, each, 75 cents
No. 34
Bow out of way for Posterior
Cavity Work
Price, each, \$1.00

*Buy of
Your Dealer*

**J. W. IVORY, 21 N. 13th Street
PHILADELPHIA, PA.**

B. D. M. Co.'s No. 90 Double Action Blower

With Separate Air Reservoir—Modified English Pattern



THE double bellows is so constructed that the full stroke on each side is effective and the air reservoir or bag is readily kept filled and at an even pressure with an easy rocking motion of the foot.

The bellows frame is of iron, nicely japanned. Calf-skin is employed for the body and the valves are carefully adjusted and tested to assure the absolute tightness of the bellows in all its parts.

The bag or reservoir is the best quality rubber procurable for the purpose, and the tubing our well known antimony tubing. The net is our linen twine

net as employed on all "B. D. M. Co." Foot Blowers.

The price, \$5.00, includes the Bellows, a three-foot piece of $\frac{1}{4}$ -inch tubing leading from the bellows to Tee; the Tee; the reservoir with net, and a two-foot piece of $\frac{1}{4}$ -inch tubing to connect Tee with blowpipe, all as illustrated. Your dealer or direct.

"B. D. M. Co.'s" No. 90 Foot Blower can be recommended for dentists' use, and is amply powerful for gasoline gas blowpipes and all ordinary blowpipes or melting appliances operated in connection with Crown and Bridge work. Ask for circular and further particulars.

Buffalo Dental Manufacturing Co.

BUFFALO, N. Y., U. S. A.

Not a Single Failure Reported

Every User that Writes Tells of Success

Thousands of boxes of Co-Arda have been sold under an absolute guarantee that Co-Arda will do perfect work as a *combination* abscess cure and root-canal filling—if used as directed—so far not a single failure has been reported.

CO-ARDA

CO-ARDA is the *only* successful combination abscess cure and root-filling on the market. Try CO-ARDA and be convinced of its time-saving, worry-saving and money-saving virtues.

Co-Arda saves hours of treatment on abscessed teeth, and it is *positive*. It saves from twenty to twenty-five minutes on every root-filling, and it is *permanent*. It works its way by capillary attraction to the end of upper molars and difficult root canals.

Will You Try It Free?

CO-ARDA is sold by all dealers—\$1 a box.

It is too valuable a preparation to be given away indiscriminately, but if you will give it a fair trial, we shall be glad, on receipt of a postal, or the attached coupon, to send a generous sample. Send for the sample today and see what you have been missing.

**The
CO-ARDA COMPANY**

Scranton, Pa.

Cut out—mail today—don't delay.
Please send me free sample of CO-ARDA and literature.
CO-ARDA CO., SCRANTON, PA.
Dr.....
Street.....
City.....
State.....
D

Salvitae

¶ The deposit of serumal or salivary calculi in or about the alveoli is a common cause of

Soft, Flabby, Bleeding and Receding Gums

¶ In conjunction with mechanical treatment, it is distinctly advantageous to administer an agent that will bring about the disintegration of these deposits and prevent their recurrence.

¶ Inasmuch as these deposits are, in the main, due to the systemic retention of an excess of uric acid, it is manifestly wise to employ a uric-solvent and eliminant. By increasing the uric-solvent power of the blood and raising its alkalinity to a normal degree, such an agent effects the dissolution of calcic concretions and precludes their reformation.

SALVITAE

is unquestionably the most powerful uric-solvent extant. It arrests the over-production of uric acid, disintegrates uratic concretions, promotes metabolism and renders the blood normally alkaline.

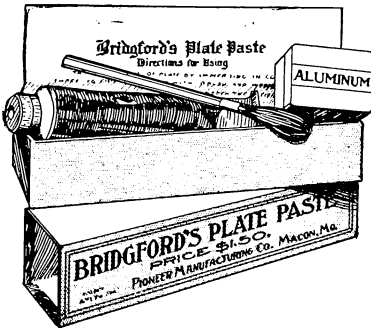
¶ **Salvitae** is an effervescent salt of delightful flavor. The dose is one to four teaspoonfuls in a glassful of water two or three times daily.

Samples and literature sent upon request.

AMERICAN APOTHECARIES COMPANY, ASTORIA, GREATER NEW YORK.

Bridgford's Plate Paste

For Misfit Plates



Saves Time, Money and Reputation

¶ You can also make temporary plates into permanent ones, without the necessity of tearing down and resetting the teeth.

Price \$1.50 per tube

Enough for 6 to 10 plates

Full directions with each package

FOR SALE BY DEALERS OR DIRECT

THE PIONEER MANUFACTURING COMPANY

MACON, MO., U. S. A.

ELLIOTT & CO., Edinburgh, Scotland

Sole Agent for England, Ireland and Scotland



ANTI-KAMNIA & CODEINE TABLETS



FOR PAIN ABOUT THE TEETH



When to Use Them

FIRST

To ease the nagging and shooting pains while operating; to quiet the nerves, and prevent the headaches and nausea which frequently follow operations, administer one Antikamnia & Codeine Tablet every hour

— GIVE ONE BEFORE BEGINNING OPERATION —

SECOND

One Antikamnia & Codeine Tablet given before and another one after extracting a tooth, will stop pain and allay irritability

THIRD

When a painful cavity exists, or a nerve or root is exposed, administer internally one or two Antikamnia & Codeine Tablets and fill the cavity with the powdered tablet, or apply it freely about the gums

FOURTH

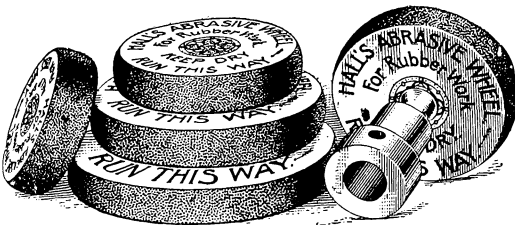
For toothache, earache and facial neuralgia, administer one Antikamnia & Codeine Tablet every two hours

FOR SAMPLES AND LITERATURE, ADDRESS

The Antikamnia Chemical Company St. Louis, Mo., U. S. A.

Hall's Abrasive Wheels

FOR FINISHING RUBBER PLATES



THIS Wheel has proven to be the most effective appliance for dressing up rubber plates ever made. It does its work in the most rapid and accurate way.

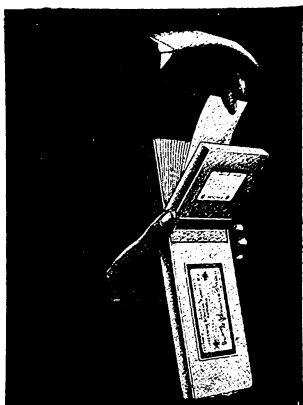
It is made up of numerous layers of emery paper coiled into a solid wheel, $\frac{3}{8}$ -inch thick. The successive layers of paper can be re-

moved as they become worn, and a fresh surface exposed for use. Each layer of paper will finish several sets of teeth. The Wheel has a rounded edge which fits nicely into all parts of a plate, and will retain its shape until the entire Wheel is exhausted.

There is an elasticity about the touch of this Wheel which makes it far pleasanter to use than burs or stones, and it finishes the plate with a smooth and even surface in a surprisingly short time. Sizes—1 inch, $1\frac{1}{8}$ inches, $1\frac{1}{4}$ inches, 2 inches. Prices—15c., 20c., 25c. and 30c. each.

THE WM. R. HALL & SON CO. 115 NO. SEVENTEENTH STREET
PHILADELPHIA, PA.

Japanese Bibulous Paper



Do You Use It?

IF YOU DO—See that it has the **Red Cross** on the *flat* package and Johnson & Johnson's name, with the guarantee that it is *surgically clean*. It costs you no more for being properly packed and clean and it is the only kind suitable for dental and surgical use.

We put this paper through the same process of bi-sterilization as our surgical dressings and put it up in a flat sealed box from which one sheet may be taken at a time without exposing the balance of package. No waste, through soiling, as with loose paper.

A paper, made under anything but cleanly conditions, is only suitable for dental and surgical use after thorough treatment for this purpose. Ask for Johnson & Johnson's *surgically clean* kind.

Put up 250 sheets $3\frac{3}{4} \times 10\frac{3}{4}$ inches in box 25 cts.

Sold by leading Dealers in Dental Supplies in every country in the world.

Specify Johnson & Johnson's

JOHNSON & JOHNSON

New Brunswick, N. J., U. S. A.

Lehman's Special Root Filling

GUTTA-PERCHA and other like material, while possessing many admirable features, is at best only a mechanical stopping, having no medicinal properties, and the success of such material as a root filling depends upon how thorough has been the removal of pulp tissue. And as this is nearly and sometimes quite impossible, as in case of extremely small or tortuous canals, especially of the buccal roots of upper molars, it will be seen how desirable is a material that will permanently prevent unsatisfactory results.

Lehman's Special Root Filling will permanently preserve particles of pulp left in canals. We repeat this statement: when it is impossible to remove all the pulp from the root canals this material will prevent putrefaction of any tissue left and a *permanent operation* will be the result.

¶ Besides filling the pulp canal, this material acts as an antiseptic continually; not only prevents putrefaction of any tissue left in the canal, but because of its antiseptic, germicidal and physical properties, prevents its own destruction by contamination with any fluid that may permeate or penetrate the tooth structure. Securely seals the apical foramen. We expect to refund your money if you have a single failure. **\$1.50 each package.**

W. T. BANTA & CO., Evansville, Ind.

A Tooth Without Metal

A Tooth Without Checks

Ground to an exact standard insures interchangeability. They fit because they have been ground to fit--no detail is hazarded to chance or shrinkage

=====

You will have a thorough understanding of

STEELE'S

INTERCHANGEABLE

TOOTH

Its uses and abuses, after reading our booklet.
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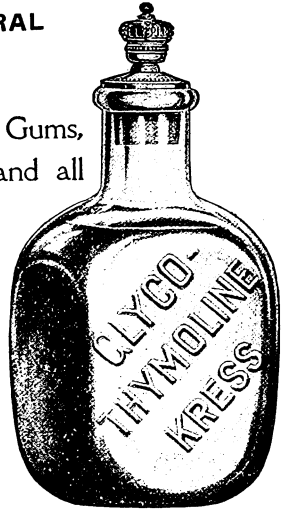
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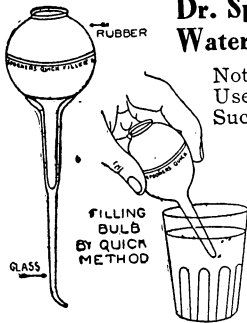
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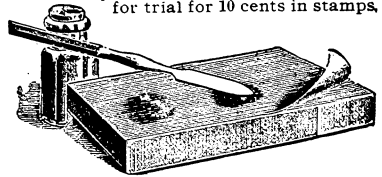
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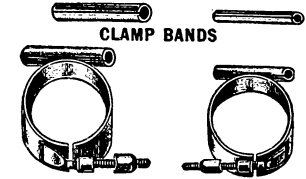
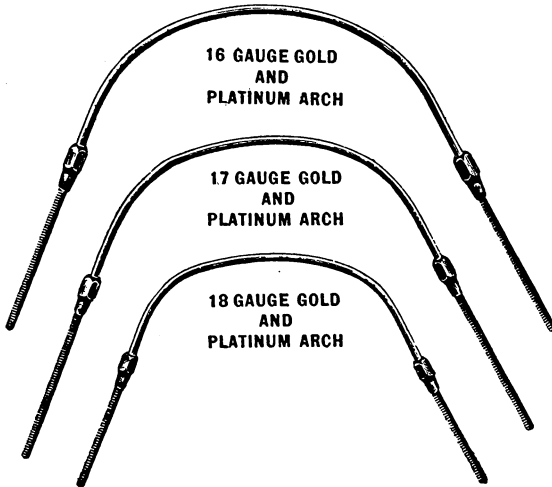
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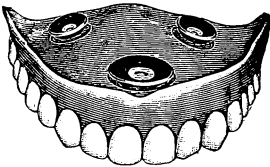
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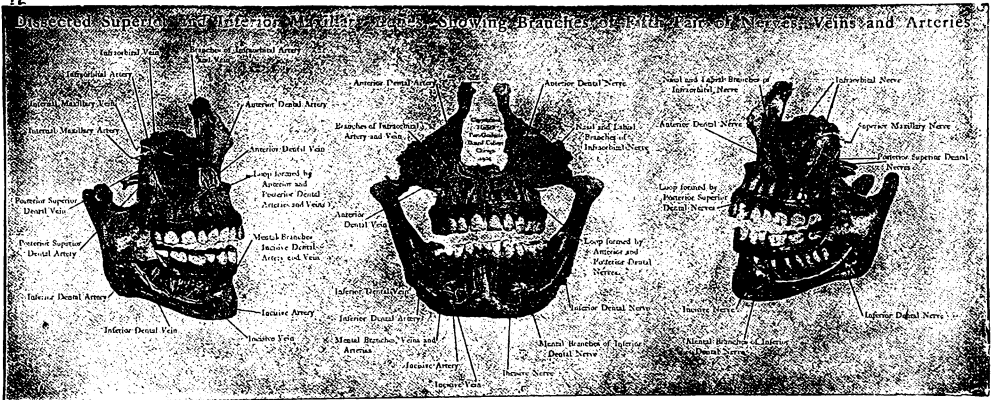
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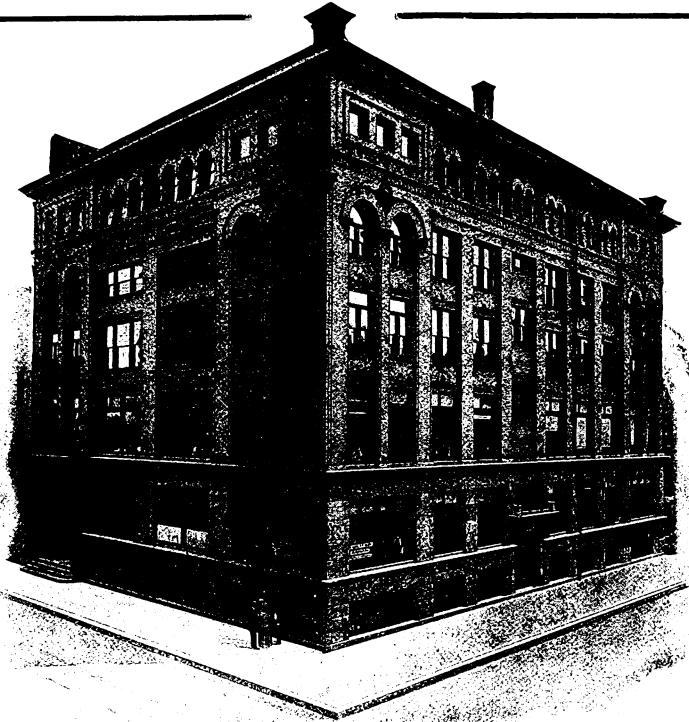
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